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Volume 61
Number 7

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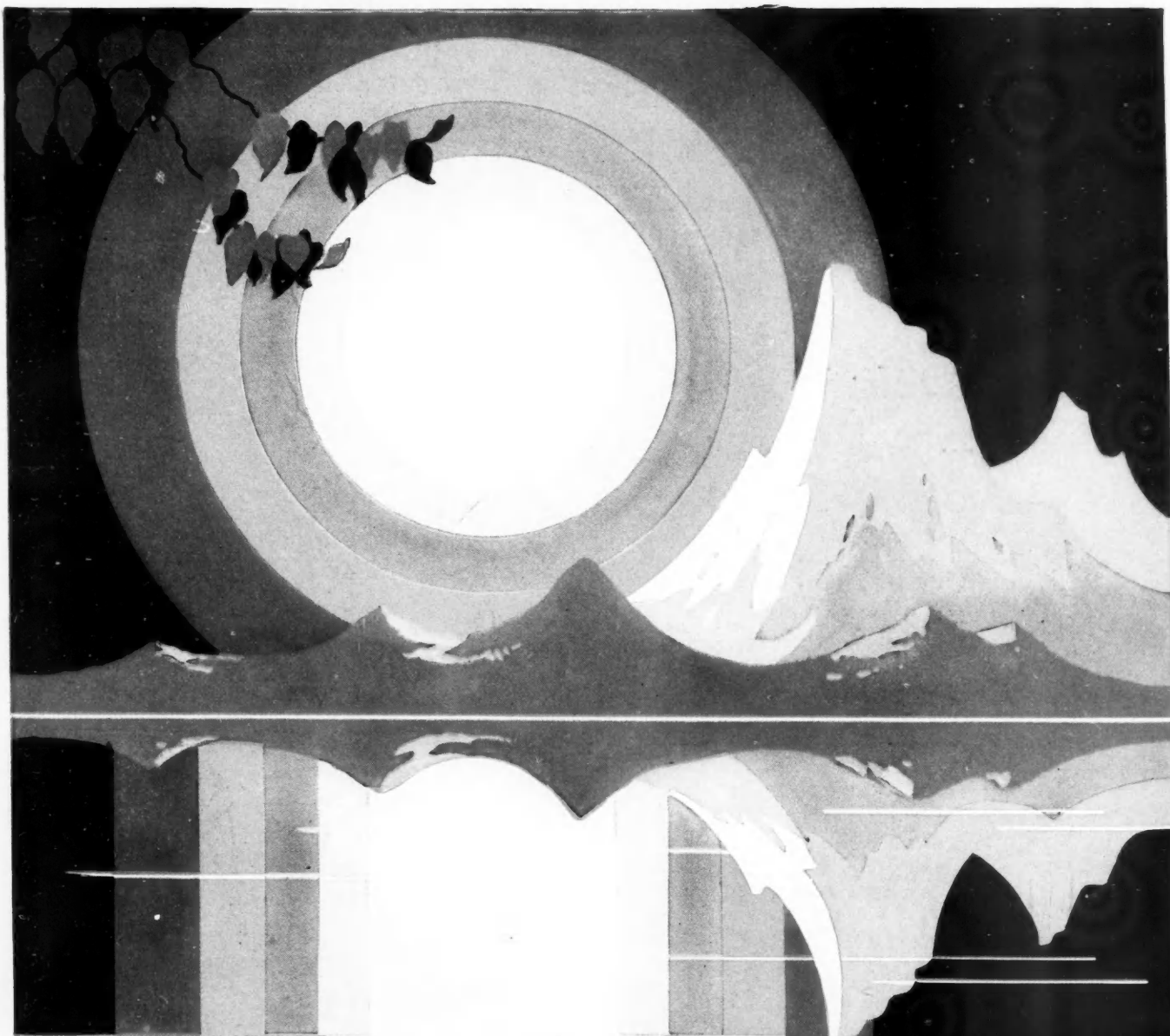
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AUTOMOTIVE INDUSTRIES

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Vol. 61

No. 7

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Contents

Will Continued High Money Rates Affect Retail Sales Eventually?	217
Differential Gear Use Limited to Operation as Equalizer. By P. M. Heldt	219
Graham-Paige Line for 1930 Featured by Six-Cylinder Car Having a Longer Wheelbase and Larger Engine. By Athel F. Denham	220
Neon Lights Used as Fog Beacons Have No Unique Features	223
Studebaker's Sheet Metal Output Doubled by Use of Conveyors	224
Curtiss Condor Biplane Built for T.A.T. is Powered by 635 Hp. Engines	226
General Motors New Antwerp Plant to be One of Best in Europe. By W. F. Bradley	229
Automatic Transmission Employed in Diesel-Engined Locomotive	231
Just Among Ourselves	233
Sunbeam Enters Bus Field With Four and Six-Wheel Chassis Powered by Six-Cylinder Overhead-Valve Engine. By M. W. Bourdon	234
Nebraska Engineers in Official Tests of Tractor Horsepower Ratings Approve New Models Manufactured by Case and McCormick-Deering	238
New Developments	240
News of the Industry	242
Men of the Industry	246
Financial Notes	247
Calendar of Events	252
Advertisers' Index	98, 99

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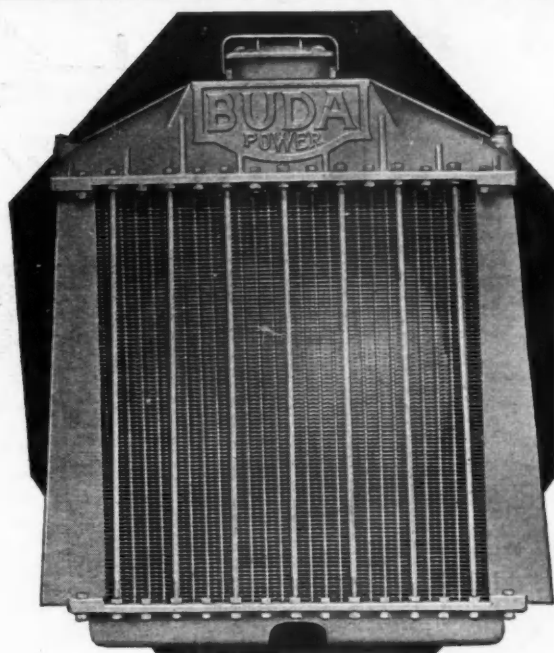
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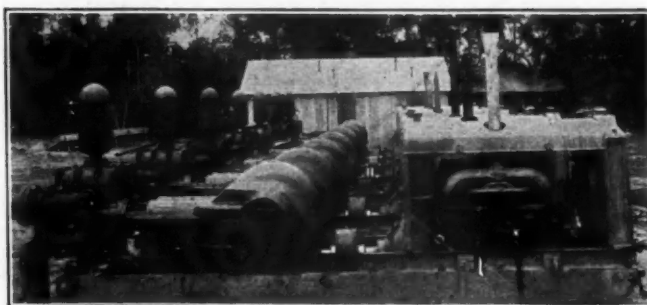
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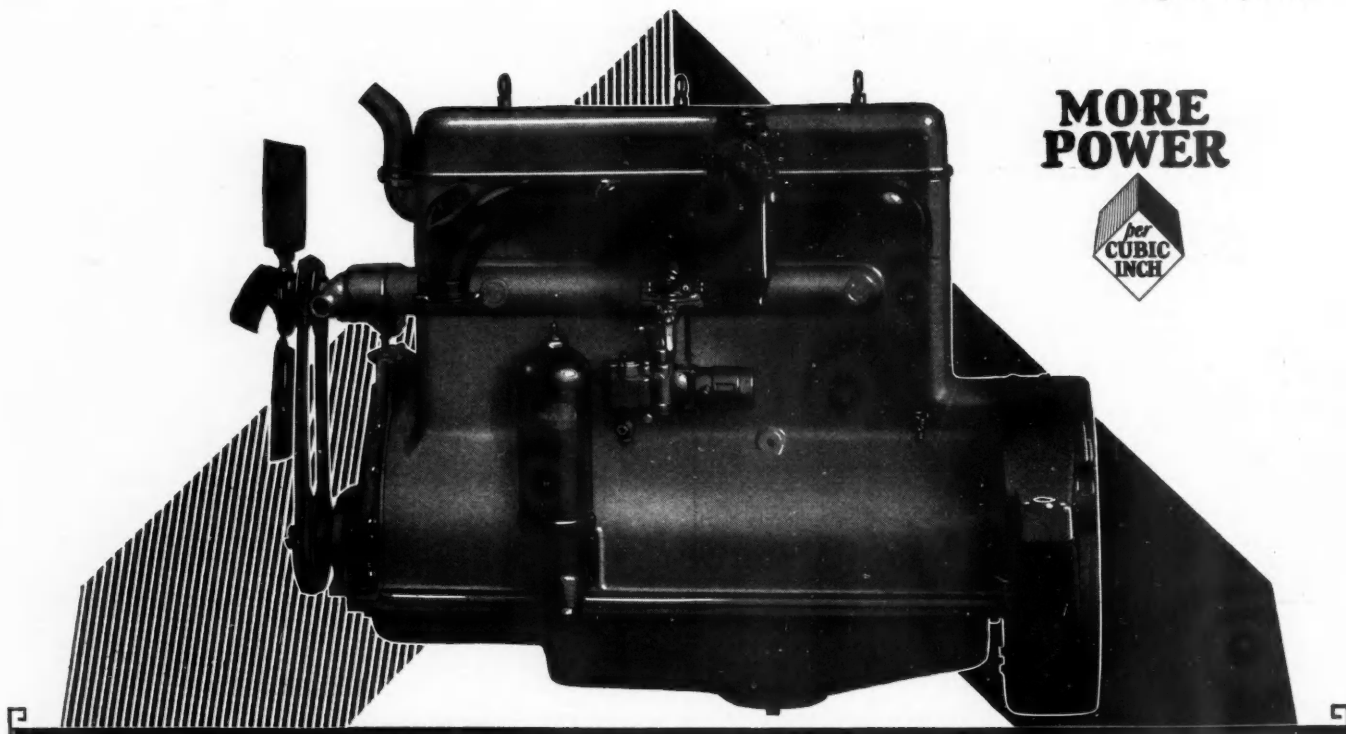
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AUTOMOTIVE INDUSTRIES

VOLUME 61

Philadelphia, Saturday, August 17, 1929

NUMBER 7

Will Continued High Money Rates Affect Retail Sales Eventually?

Time for definite reaction in automobile market is passed, one leader says, but an adverse reflection in public buying power is thought possible by others

IF high rates on both time and call money continue for the next six or twelve months, is the volume of retail automobile sales likely to be affected adversely? Are retail financing rates likely to increase and thus add another element of sales resistance in the retail market?

These questions have been in the background of the minds of a good many automotive factory executives for several months. They have formed the basis for a fair number of rather casual discussions among groups of executives and, while not considered acute at the moment, the problems which they involve are being argued seriously in many quarters.

Questioned regarding his opinion on the subject recently, a leading Western banker, close to the automotive situation, said that retail automobile sales couldn't help but be affected adversely by a continuance of high money rates. He wasn't inclined to think of retail financing rates as a vital factor in the situation, but rather of the indirect effects on general public buying power.

"Take the situation in our own city," he said. "True, our factories and business men have been able thus far to get all the money they need to keep their businesses running properly and to finance

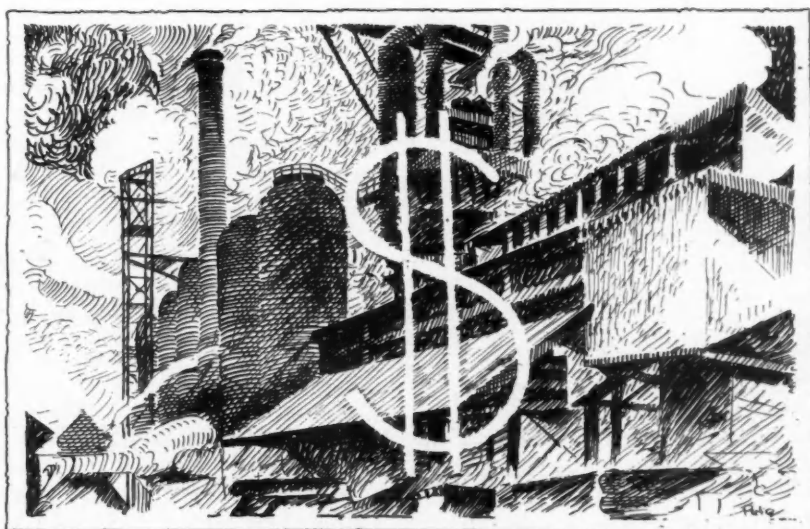
necessary new buildings and developments. But I know of several million dollars' worth of construction and development activity which is not being put through at this time simply because money costs too much. That means less employment and less earning power on the part of the average worker than otherwise there would be.

"We will feel the results of these indirect effects," he continued, "before we run into any actual inability to pay for money necessary to the operation of businesses on their present levels."

Despite this relatively pessimistic view, however, few evidences can be found among automotive leaders and automotive finance company men of any fear of acute developments either in the sales or financing situation.

Increases in finance company rates on retail and wholesale operations, of course, must be recognized as a possibility should high money rates continue indefinitely. Two factors will operate, however, to

hinder this trend. To begin with, the price the finance company pays for money is only one of many factors which enter into its operating cost and into its rate making. A 5 per cent increase in money rates doesn't mean anything like a 5 per cent increase in costs. Thus, even if rates were raised to



take care of the increased money rates, the actual advance to be paid by the dealer or the automobile buyer probably would be relatively small. This is indicated by the fact that, while major rate adjustments have not been common among the important finance companies, increases actually have been made by a number of finance organizations in the last six months. And during that time certainly no definitely adverse effect has been noted in the retail automobile market.

Then, too, there is the close affiliation of some of the more important finance companies with car manufacturers which will almost certainly be a strong influence against increased rates. From the standpoint of a large manufacturing organization it might easily be better business to make less money through financing operations and still keep car sales up and factories moving at capacity than to increase financing rates and perhaps affect retail sales adversely.

Repossessions this year caused some concern with several important finance companies early in the year, but by the time the mid-year mark was reached the situation seemed to have been brought well under control. At the present time it probably is fair to say that repossessions are running along on the average at about the same rate as they were during 1928—and there was nothing particular to worry about then.

It is interesting, too, to note some superficial indications existing that the percentage of cash sales made by dealers today is slightly greater than in previous years rather than less. No comprehensive records are available at the moment on this factor, but one organization in touch with practically every element in the financing situation believes this to be the case, while scattered inquiries among dealers tend to bear out the contention.

If this be the case, it is hard to see how the industry has much to fear from a continuance of high money rates for a long while to come at any rate. As the president of one big car company expressed it the other day: "Money rates have been pretty high for quite a while now. It seems to me that, if we were going to get any definitely unfavorable reaction in the retail automobile market, we already would have had it." Thus, there would appear to be no special reasons for immediate worry over this phase of the sales situation, even if the Philadelphia *Public Ledger's* prognostication of August 8 that "Wall Street is looking for comparatively tight money for the remainder of the year" proves entirely accurate.

Further reason for looking on the financing situation with optimism perhaps may be found in persistent rumors that there is some possibility of success for efforts being put forth to get the Federal Reserve Bank to rediscount finance company paper as such.

At the present time Federal Reserve regulations

defining the character of paper eligible for rediscount read in part: "It must be a negotiable note, draft, or bill of exchange which has been issued or drawn, or the proceeds of which have been used or are to be used *in the first instance*, in producing, purchasing, carrying or marketing goods in one or more of the steps of the process of production, manufacture or distribution, or for the purpose of carrying or trading in bonds or notes of the United States, and the name of the party to such a transaction must appear upon it as maker, drawer, acceptor, or indorser."

When an automobile dealer takes a purchaser's note in connection with the sale of a car, that note itself is eligible for rediscount under the present provisions and interpretations of the regulations, having been "used in the first instance."

When a finance company, however, issues a single note covering the total of all the individual notes taken by it, that finance company note, under existing conditions, is not eligible for rediscount, not having been "used in the first instance."

Could ways and means be found of making this blanket finance company note eligible for rediscount under Federal Reserve regulations, an obvious advantage would appear to accrue to the automobile finance companies, and thus put them into a better position to render current type of service and current rates, even under high money conditions.

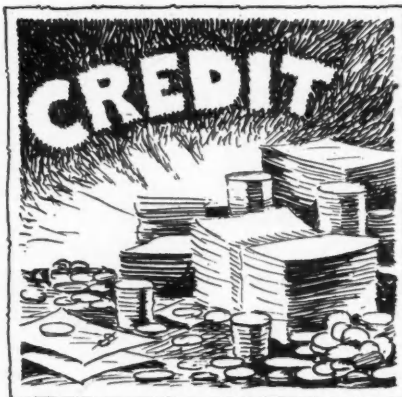
Just how much actual possibility of such a development really exists is difficult to say with any certainty at this time. From the standpoint of the automobile industry, as well as from the standpoint of the finance companies, it would seem on the surface at least to be a desirable development.

Viewing the general credit situation as a background for fall and winter automotive merchandising developments, the following paragraphs from a summary issued August 7 by the Trade and Securities Service of Standard Statistics Co., Inc., are pertinent:

"The Federal Reserve Board is temporarily out of the limelight. About two months ago it approved a policy to be put into effect by the various reserve banks about this time of easing credit through the more liberal purchase of bills. This policy is now evident in the operations of several reserve banks, particularly in the West.

"The intention is to provide credit for crop-moving purposes primarily, but there is no way of preventing this relaxation from being felt in the security markets.

"While Washington authorities do not pretend to predict future movements of security prices, yet it seems to be rather freely admitted that there is nothing in the credit situation so far as Washington is concerned to prevent the general level of prices from moving up this fall."



Differential Gear Use is Limited to Operation as *Equalizer*

Freezing of pinions often follows the practise of transmitting power through one road wheel only as in dynamometer tests or burning-in process for brake linings.

By P. M. HELDT

SOME trouble has been encountered recently from the "freezing" of pinions when transmitting power through the differential gear to or from one road wheel only. For instance, one wheel of the car may be jacked up and power obtained from it by means of a belt; or one of the rear wheels may be placed on the drum of a chassis dynamometer and the dynamometer driven from the car engine through this wheel. In either case, the power is being transmitted through the pinions of the differential. Moreover, with certain types of brake linings, we understand, a burning-in process is employed which consists in running the rear wheels onto a dynamometer, setting the brakes and then turning the wheels by means of the dynamometer.

Normally, of course, both wheels would be turning, and slippage would occur at the brake surfaces, but occasionally one brake holds much better than the other and its wheel may slip on the drum, while the other wheel will slip its brake, as intended. In that case one differential side gear remains stationary while the other one is turning. There may not be much torque on the differential pinions in that case, but they will be turning at a high speed, with the result that the bearing surfaces will get hot and the oil will become very thin. Under conditions like these the pinions are likely to seize.

No Motion on Bearings

For the amount of power it has to transmit, the differential gear is a very compact device. The pressure on the bearing surfaces of the pinions under full engine torque transmitted through the low gear in the transmission figures out to about 5000 lb. p. sq. in., which is about ten times the unit pressure allowed in railroad car journals. That so high a unit pressure is allowable in the differential gear is due to features of design and to operating conditions. The journals and the bearings are both made of hardened steel, and normally there is no motion at the bearing surfaces.

In making a right angled turn, the circumference of the outside wheel travels farther than that of the inside wheel by a distance equal to 1.57 times the wheel tread, or 88 in. for a standard tread of 56 in. If the wheel is 30 in. in diameter or has a circumference of 94 in., one side gear of the differential must make 0.935 turn relative to the other. If we assume that the side gear moves through 0.935 revolutions, it moves through an angle corresponding to 16.8 teeth. This would correspond to 1.68 revolutions of the pinion around its

axis if the pinion axis were stationary; but since the pinion axis moves at one-half the speed of the pitchline velocity, the pinion makes only one-half this number of turns, viz., 0.84, around its own axis.

In ordinary driving, an angle of 90 deg. is usually the maximum angle described in making turns, and in that case the pinion turns on its pin less than one complete revolution. During this slight relative motion there is no opportunity for any appreciable heat to be generated, nor for cutting between the bearing surfaces to start.

Heat Develops Quickly

The conditions are entirely different when one-wheel is jacked up and power is being taken from it. If this road wheel is turning at the rate of 30 m.p.h., for instance, it will make 336 r.p.m., and since the differential pinion makes 0.84 revolutions around its own axis to 0.935 revolutions of one of the driving wheels, the speed of the differential pinion around its axis in this case would be 305 r.p.m. Under these conditions a great deal of heat is being developed at the bearing in a few minutes. From data on permissible bearing loads it would appear that if anything like the full engine load is being transmitted through the differential pinions, it is quite impossible to maintain an oil film on their bearings, as the unit pressures are too high.

Differential gears are designed for one specific purpose, and they are made as small and light as is possible consistent with the legitimate demands made upon them, because the weight of the differential gear is unsprung weight, which has a detrimental effect on the riding qualities and on the wear and tear on tires. If it is attempted to use the differential as a power-transmitting device rather than as an equalizer, trouble is likely to ensue, because it is not designed for that purpose and its members are of inadequate size to carry the full engine power under such conditions. Moreover, the smaller the clearance between the pin and the bearing, the greater the likelihood of trouble of the kind referred to, because the smaller will be the differential expansion required to cause the pinions to seize. This may explain why the manufacturer of one of the highest grade cars on the market has had to send out a notice that differentials will not be replaced free of charge under the guarantee if the trouble with them has been caused by running the car with one wheel jacked up.

This limitation of the differential gear as currently applied in passenger cars often has been a surprise to those affected by it, and it should be better known.

Graham-Paige Line for 1930 Having a Longer Wheel

An increase of $\frac{1}{8}$ in. in the bore
in raising the power to 66 hp.
ratio, reduced to 5.15,

By ATHEL F.

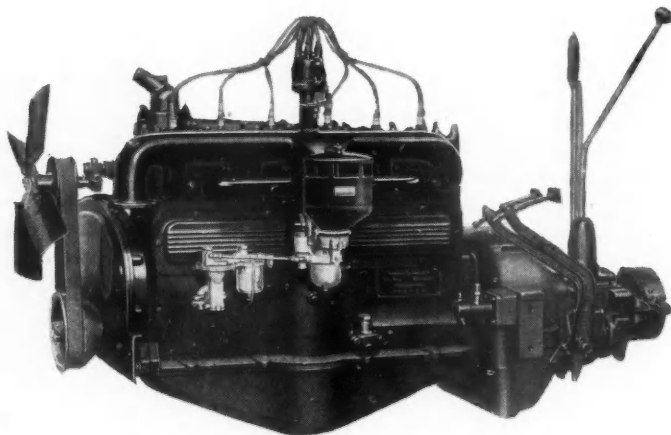
FEATURING the announcement of its 1930 models, Graham-Paige Motor Corp. presents a new edition of its lowest-priced six, the 612, with a 3-in. increase in wheelbase, a larger engine, larger bodies, adjustable seats both front and rear, and many other detail improvements. Prices have not been changed and the writer understands that no price changes are contemplated. This gives Graham-Paige a 66-hp., 115-in. wheelbase, six-cylinder car selling at \$855 for the sedan and upward for other models.

Numerous improvements have been incorporated also in the other chassis models of the Graham-Paige line. On the 615 chassis, a new engine mounting is used. At the front there is a two-point rigid support. Pressed steel brackets, integral with the chain-housing cover, are bolted directly to webbed brackets and riveted to the inside of the frame side channels, forming an additional solid cross-member. At the rear, the engine is mounted with tension-type rubber supports. These supports are in the form of two steel plates, between which there is a layer of rubber in tension. The bond between the two plates is obtained by vulcanizing the rubber to both. In addition, the top and bottom ends of the outer plate are bent over to project across the inner plate, without touching it. This is to prevent a mechanic from allowing the engine to hang by one of these supports only, when taking the engine out of the chassis, etc., which might produce enough strain to tear the rubber.

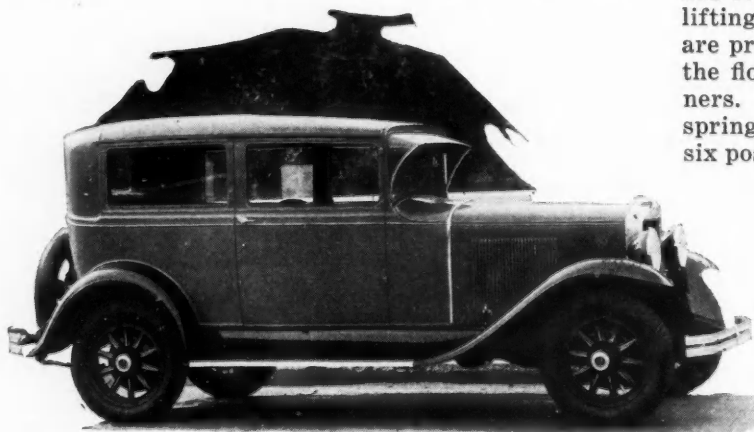
Other changes found on all models of this chassis include a three-spoke steering wheel, and a new type of instrument panel. In the latter, the instrument board is not decorated, except for a chrome bead outline, the instruments being individually mounted back

of square openings, in line, and outlined individually by narrow bands of chrome plate.

Adjustable front seats are found in all closed bodies, and in the coach both front seats are fully adjustable. The method of adjustment used on the



Power has been increased in the new Graham-Paige 612 engine, pictured above. Note the new construction for the chain housing cover, forming the front end supports



The above is the 1930 model Graham-Paige 612 two-door sedan, listing at \$855

latter model is one of the most practical the writer has ever seen. Built into the bottom of the seats, and lifting with them when the seats are tipped forward, are pressed steel runners, hinged to brackets bolted to the floor boards. The seat itself rests on these runners. At the base of the outer side of each seat is a spring-loaded pin, which locks the seat in any one of six positions by means of holes in the runners.

In order to move the seat forward or back the occupant does not have to change his position in any way. He merely reaches down to the pin with one hand, pulls it out against the light spring pressure, "hitches" the seat forward or pushes it back the desired amount, and releases the pin. The sliding action is quite easy, due partly to a balancing spring in the seat adjustment which assists in moving the seat to a more forward position. Full cross seats are adjusted by means of a crank handle and fine pitch screw, the

Featured by Six-Cylinder Car base and Larger Engine

of the powerplant has resulted at 3000 r.p.m. Compression gives smoother operation.

DENHAM

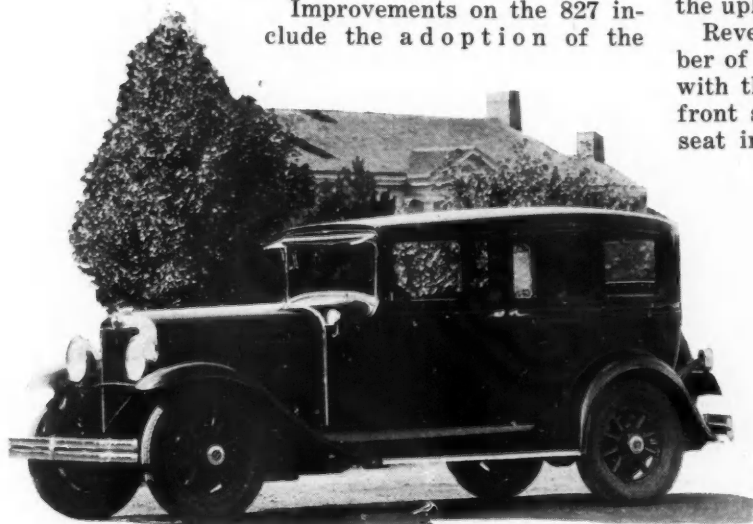
screw being self-locking in any position.

Rear seats are adjustable in two positions. This adjustment is accomplished by means of two sets of holes in the seat cushion frame, into which fit lugs projecting from the seat pan frame.

In the 615 closed models is an improved roof construction, with strengthened bracing at the front corners and heavier tenoned short side bows. Windshield frames are now chrome-plated, and the sun visor is of opaqued glass in chrome-plated brackets. The seat construction is said to have been improved materially with better upholstery.

On the 621 series the adjustable seats are also found, as well as the new style sun visor, improved upholstery and seat construction, and strengthened roof construction.

Improvements on the 827 include the adoption of the



Above is a view of the Graham-Paige 615, 1930 model, four-door sedan listing at \$1,195, and, as formerly, it is equipped with a four-speed transmission

adjustable front seats and two-position rear seats, the new sun visor, softer cushions, and new trim detail. The major change in the 837 is in the adoption of duplex springs in the seat cushions. In this type of construction, ordinarily used only in custom-built cars, there are two layers of springs, each layer sepa-



Graham-Paige 612 four-door sedan

rately bound, and the assemblies clipped together by means of the spring frames. The lower layer of springs is of fairly heavy stock, while the upper is light. The function of the first is to provide for major road unevenness, while the upper layer is intended to provide a self-conforming action to the seat cushion, and to take up the minor deflections due to road ripples, etc.

In the cross seats, moreover, the upper layer is assembled in two parts, a right and a left, split in the middle, for more effectively maintaining the shape of the upholstery.

Reverting to the 612, this also incorporates a number of the body improvements described in connection with the other models. The two-door sedan has both front seats adjustable as described above, the cross seat in the four-door model also being fully adjustable, as well as the rear seats (two-position) in both models. Improved roof and seat construction are also found on these models. Then there is the three-spoke steering wheels on both sedans, the adoption of plain chrome cowl bands without cowl lights on the two-door model, as well as black cowl lamps with chrome rims on the latter, a new type of instrument panel on all models, similar in design to that of the 615, and a new design tail and stop light.

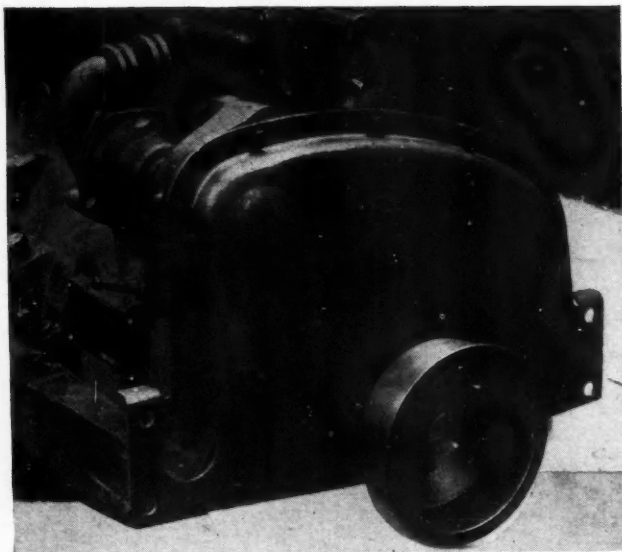
The latter uses a single Mazda No. 1158 bulb with single filament for both purposes. The bulb itself is a 21-candlepower, 6-8 volt, double contact. A resistance is inserted in the tail light circuit to reduce the illumination to the normal 2 to 4 candlepower. Application of the foot brake short-circuits this resistance, thereby increasing the intensity of illumination to 21 candlepower. The device has the advantage of simplicity. It also provides a quick check on the functioning of the stop light, since if the tail light works, and the stop light does not, it is self-evident that the trouble is in the short-circuiting switch, whereas if the stop light works and the tail

light does not, the trouble is with the resistance.

Outstanding changes in the chassis are the increase of approximately 3 in. in wheelbase to 115 in., and the increase in power of the engine to take care of added weight and provide faster get-away. An increase in bore of $\frac{1}{8}$ in. to $3\frac{1}{8}$ in. has resulted in raising the power from 62 hp. at 3200 r.p.m., to 66 hp. at 3000 r.p.m. At the same time, the compression ratio has been reduced from 5.57 to 5.15 to assure smoother operation. With the same object in view, the spark is now set to occur 1 deg. ahead of top dead center (instead of 7 deg.), with the hand control in the most retarded position.

Other engine changes include an increase in the oil capacity from 6 to 7 qt. and the adoption of the same engine mounting as on the 615. A starter and a generator of new type are now being fitted. In the transmission the gear ratios have been slightly reduced to increase the acceleration, the new ratios being 1.677 in second, 3.039 in low and 3.647 in reverse. The bronze bushing formerly used on the main shaft at its forward end has been replaced by a ball bearing.

The tire size has been increased to 5.25/19 on all models with the exception of the two-door sedan, which retains the former tire size of 5.00/10. The brake lining width has been changed to $1\frac{1}{2}$ in. for both front and rear wheel brakes. The frame channel depth has been increased $\frac{1}{32}$ in. to a maximum of 5.5



Front view of Graham-Paige engine showing new front support construction, which functions as a cross-member

in., and the stock is also heavier. The number of leaves in the rear springs of the four-door sedan has been reduced from 10 to 8 for easier riding.

One interesting body development found on all Graham-Paige cars is the new floor board construction in the front compartment. Instead of using the conventional boards and rubber mat, rubber is molded directly to the floor plate, $\frac{1}{8}$ in. thick, both on the surfaces and around the edges, in steel molds under 2000 lb. per sq. in. pressure. The rubber also extends beyond the edges of the floor plate in the shape of a flange to form a seal around the plate, while some rub-

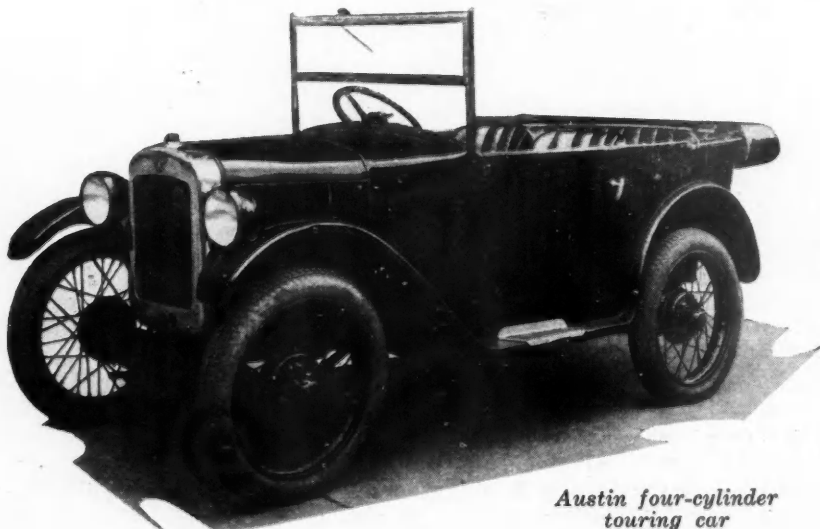
ber is also found on the under side around the edges where the plate rests on the body sills, to prevent squeaks.

Aluminum draft plates with live rubber inserts are screwed to the plate in addition to form a seal around the controls and steering column. In these models which are equipped with adjustable steering columns (all except 612), this live rubber is free to slide under the draft plate to adjust itself to the column position and maintain the seal.

The chief advantages of this type of construction, aside from the simplification in removing the floor plate, are in the neater appearance which can be maintained over long periods than with the removable mat type of design, and the better seal around the control openings.

Austin to Build Cars in America

THE Austin four-cylinder touring car of British make, is shown in the view at the right. The American Austin Motor Car Co., the organization of which was announced in *Automotive Industries* recently, will manufacture a car similar to this except that it will have a left-hand drive and some body refinements. The new American plant is to be located at Butler, Pa., in the old Standard Steel Car Co. auto works.



Austin four-cylinder touring car

Neon Lights Used as Fog Beacons Have No Unique Features

Bureau of Standards finds similar results can be obtained from incandescent lamps of the same color and candlepower.

THE development of commercial neon lamps led to experiments with such lamps as marine and aeronautical beacons. These experiments have been followed by frequent claims that the light from neon lamps has exceptional fog-penetrating properties, but no definite evidence was offered to support the claims. Contrary opinions followed in turn.

Experiments were made recently by the Bureau of Standards to determine definitely, under controlled conditions, whether the light from a neon lamp becomes visible from greater distances, or remains visible at greater distances, than light from an incandescent lamp with a color filter, when the color, shape and brightness of the source, the angular distributions of intensity in the beam, and the weather conditions are the same in both cases. As a matter of additional interest, the effect of the color filter upon the visibility of a clear beam was also determined. In general, the method was to observe flashlight signals from an experimental beacon from various distances and under various weather conditions.

From the results obtained so far, which are fully described in an article in the July issue of the *Bureau of Standards Journal of Research*, by F. Chapin Breckenridge and J. E. Nolan, the following conclusions are drawn:

"There is no difference, sufficiently great to be found by the methods of the test, between the visibility of the light from a neon lamp and light of the same color and horizontal candle-power distribution from an incandescent lamp.

"With regard to the comparison between the clear and red beams, the results of the test admit of no doubt. The addition of a red filter does not increase the range of a clear beam under any weather conditions. It was, however, noted that the red and neon flashes were generally easier to find among the shore lights, especially before the observers had learned just where to look for the beacon.

"These conclusions applied to the problem of beacon design suggest that the neon lamp must be compared with the combination of incandescent lamp and color filter entirely on the basis of performance at the beacon. First of all we must have a neon lamp which has a sufficiently high brightness to make possible a sufficiently high intensity without using reflectors of impractical size. Second, the lamp and such auxiliary apparatus as is necessary must be reliable and inexpensive to maintain. If a neon lamp can be produced satisfying both these requirements it will merit consideration upon the basis of efficiency alone, and in this respect it seems likely that the neon lamp will stand superior to the combination of incandescent lamp and filter.

"In localities where competing lights are not common the use of incandescent lamps without filter makes possible longer distances between beacons. It seems probable that in regions where airway beacons must be seen against a background thickly set with other lights, the loss of range which is caused by the use of a red filter is more than compensated by the greater facility with which the red flashes can be picked up."

An example of the commercial use of the neon lights is found in the first of the thirty 125-ft. aviation and automobile beacons being erected along the Pacific Coast from the Canadian Border to the Mexican Line by a California oil company.

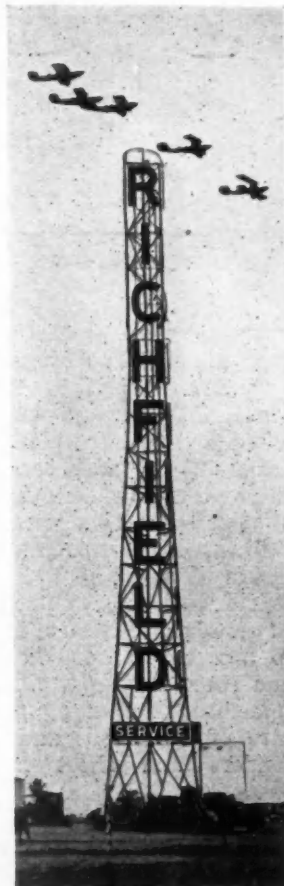
This beacon stands near San Diego, Cal., and is the southernmost of the sites, all of which have been obtained, with construction

started on 15 of them. These beacons are triangular, located in the center of a plot of ground five acres in area. No beacon will be in any town or city, but all are on the main north-and-south highway through Washington, Oregon and California.

The beacons which are uniform—are 125 ft. high, covered with brilliant neon lights on three sides from 20 ft. above ground to the top. On the apex is located a constant, three-sided, stationary beacon. The neon lights on the sides are visible 35 miles in clear weather and a minimum of 25 by reflection from the ground in fog, according to the backers of the beacon plan.

One other beacon will be placed near Reno, Nev., where the Lincoln Highway enters California, and another at or near Yuma, Ariz., where the main southern highway crosses into the Golden State.

The cost of the chain of 30 and of the two side beacons on the state line is being borne by the oil company, to an estimated total of \$5,000,000, and the same corporation has provided with the state highway commission for the maintenance of these light towers, the first of their kind in the world.



Neon lights on an airway beacon near San Diego, Cal. Thirty of these lights are to be erected along the Pacific Coast.

Studebaker's Sheet Metal Output Doubled by Use of Conveyors

Assisting finishing process with mechanical handling system increased production to 800 hoods and 350 sets of fenders from 400 and 125 units respectively.

THE removal during the past year of most of the major manufacturing operations from Detroit to South Bend by the Studebaker Corp. placed a rather heavy load on the layout department at South Bend. Although plant expansions were put through, in most cases it was necessary to increase the production facilities per square foot of floor space to a considerable extent.

This was particularly true of the sheet metal finishing operations. Previous to the concentration of this activity in South Bend, a floor space of approximately 60,000 sq. ft. was used in which to take care of 400 hoods, 125 sets of fenders and sheet metal parts. Following the move the same amount of floor space was required to take care of 800 hoods and 350 sets of fenders and sheet metal parts.

The successful increase in production facilities was accomplished through conveyorizing, generally of the overhead I-beam type, eliminating almost all

manual handling, and the revision of finishing processes to conform with the conveyorized handling of the parts. All parts are thus kept in motion and the necessary work performed almost entirely while on the conveyors.

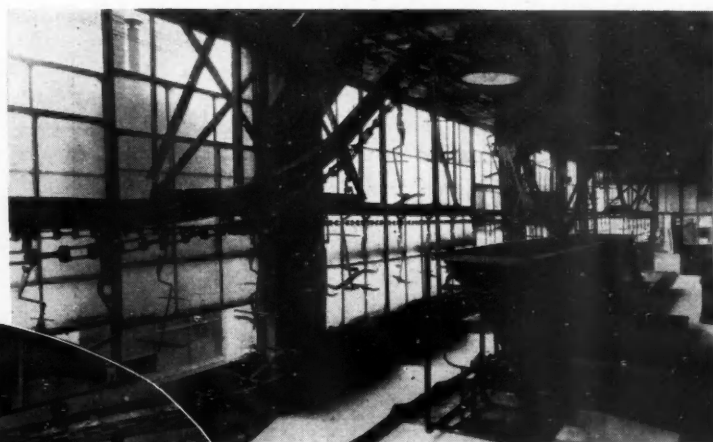


Fig. 3—The conveyorized dip tank in the Studebaker plant is shown above. Note the mechanical agitator at the end of the tank

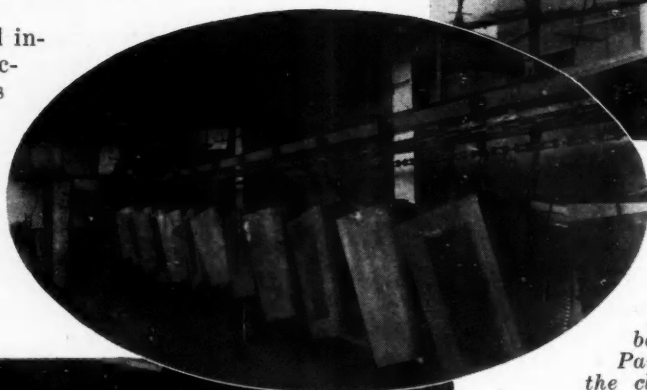


Fig. 2—The view at the left shows the Studebaker hoods air-drying after application of Pamco cleaner to allow the chemical action of the cleaner to take place. The cleaner is later removed with wire brushes, etc.



Fig. 1—This view shows hoods on conveyor with the spray booth for application of Rex Pamco cleaner in the foreground

There are three major units—the hood department, sheet metal parts and fender unit, and the instrument board and garnish molding unit. In the first, the hoods arrive on the metal finish conveyor, and are transferred to the lacquer conveyor, where Rex Pamco reducer is applied to rust spots and rolling mill ink spots. This cleaner is also sprayed on to the outside of the hood (see Fig. 1). Between this operation and the baking oven through which the hoods next pass, there is an interval of 8 to 15 min. of air drying to permit the chemical action of the cleaner to take place (see Fig. 2). After baking the hoods on the conveyor for from 20 to 30 min. at 400 deg. Fahr. they are allowed to cool 5 min. The cleaner then is scuffed off with wire brushes and steel wool, louvres and hinges power brushed, and inside and outside tack ragged. After washing the hoods off with an alcohol cloth, they pass through a tank of dipping primer (Fig. 3) without

removal from the conveyor, this tank being constantly agitated mechanically, both at the top and the bottom. The conveyor next carries the hoods through the primer oven for baking 2 hrs. at 350 deg. Fahr. After being allowed to cool 5 min. they are sanded slightly where needed.

Six to eight single coats of lacquer with a 10-min. intermediate drying period between each coat precedes the final drying of the lacquer at 170 deg. Fahr. for three quarters of an hour. At this point the hoods are removed for the first time from the conveyor and are water sanded, after which they are hung back on the conveyor and the seams are blown out with air. A mist coat is then sprayed on. At this point also, all hoods which have some repair spots are touched up. The inside of the hood is then sprayed with a black underside paint and dried three-quarters of an hour at 170 deg. Fahr. The hood half is once



Fig. 4—Slat type of conveyors (above) carry hoods past the stripers in Studebaker revised plant. Packard striping pencils are used here, further reducing costs by taking the striping operation out of the hands of specially trained craftsmen



Fig. 5—Frequent transfers of fenders and other sheet metal from one conveyor to another are made in finishing unit No. 2 by the use of a single 4619-ft. conveyor (left), driven by a single motor



Fig. 6—An automatic shower bath system is used for the spraying of the primer coat in the fender and sheet metal finishing department of Studebaker

more removed from the conveyor for a Parko-Rub and polish, is rehung and travels on to the assembly and striping department, where they are taken from the conveyor and hinges, corner pads and handles are assembled and riveted.

Striping of the hoods is performed with Packard pencil stripers on a slat type of conveyor (Fig. 4), after which two hood halves are assembled and put on another overhead conveyor to be delivered to the final car assembly line. The new set up increased production from 400 to 800 hoods per 10-hr. day.

Cleaning of the sheet metal parts is similar to that with the hoods described above, but instead of a tank of dipping primer, a Floco system automatic shower

bath spraying installation is used, as shown in Fig. 6, from which the parts move on into an oven for a 2-hr. bake at 350 deg. Fahr.

After a cooling period of 5 min., and a sanding if necessary, the fenders and sheet metal reach the lacquer spray booths. Here two or three double coats of lacquer are applied, a double coat at a time, with 10 to 15 min. air-drying periods between coats (see Fig. 5), there being a 45-min. bake at 170 deg. after the final double coat. Oil sanding, the next operation, requires the removal of the parts from the conveyor, but subsequent mist-coat spraying and back underside paint spraying is performed while the parts are in motion.

A similar increase in production facilities is found in the instrument board and garnish molding layout, production having been increased 200 per cent, with a cost reduction of 35 per cent.

To illustrate the operations, grained garnish moldings are taken off the incoming conveyor and hung on the washer chain which takes them through a Blakesless Duplex washer, in which they are washed with an alkali cleaner and rinsed in hot water. They are removed from the washer chain, blown out with air and hung on an overhead I-beam conveyor which takes them to the floor above, where they are removed and tack ragged with alcohol.

Special crates are provided on the conveyor on which they are placed to permit the spraying of combination ground color and primer. Stain and grain are also applied at this point, after which the parts are hung separately on a conveyor, taking them through an oven for one hour's baking at 290 deg. Fahr. Parts are then mossed off, tack ragged and air dried. Following the uniform dip process they are allowed to cool and are then polished and hung on a conveyor taking them to the stock room.

NOTE: Data contained in this article was supplied by William Pfeil of the Studebaker Layout Department, who is responsible for these effective installations.



View of Curtiss Condor biplane built for the Transcontinental Air Transport Service

Curtiss Condor Is Powered by

*While constructed to carry 18
an attendant, the craft
persons in tests con*

A NEW addition to the list of American large transport planes is the Curtiss Condor 18-passenger plane, which was flown for the first time on July 21 at Garden City, N. Y., where the experimental laboratories of the Curtiss Aeroplane & Motor Co. are located. Six of these planes are being built for the Transcontinental Air Transport, Inc. The Condor differs from other large passenger planes familiar to the American public in having two instead of three engines. It is the contention of Curtis engineers that since either a two-engined or a three-engined plane can keep the air with only one engine operating, and since the chance of one engine becoming disabled is greater when there are three than when there are two engines, the factor of safety is greater with two.

In the test of the Curtiss Condor biplane, held at Roosevelt Field, N. Y., on July 21, 19 and 20 persons, besides the two pilots and an attendant, flew at one time. The Transcontinental Air Transport specifications call for an 18-passenger load, but the actual capacity limit of the Condor, under the Department of Commerce restrictions for safety, is as high as 25 persons. In the tests the plane left the ground after a run of 600 ft. and climbed with ease. Among those who flew during the tests were Frank H. Russell, vice-president, and T. P. Wright, chief engineer, of the Curtiss Aeroplane & Motor Co.

It will be seen from the accompanying photographs that the Condor is of the biplane type, and the manufacturers explain their choice of this type by pointing out that the wing area necessary for a low landing speed can be disposed with the least overhang or span in this form of construction. They also observe that a monoplane of sufficient strength calls for heavier construction, which results in a greater total weight.

The Condor is powered with two Curtiss water-cooled engines of 635 hp. each. The reason for choosing water-cooled rather than air-cooled engines of approximately the same power is that the engineers felt that in the higher horsepower ranges the water-cooled type of engine has a longer record of sustained reliability. The engines are fitted with gear reductions of 2 to 1 ratio, the engine speed being 2400 and the propeller speed 1200 r.p.m.

Another point mentioned in favor of the choice of two engines is that the absence of a third engine makes possible an arrangement of the pilot's compartment, giving the pilot unobstructed vision in all directions. The entire front of the ship is glass-covered. Windshield wipers are provided for bad weather.

Wheel brakes are standard equipment, as are gasoline dump valves, landing lights, running lights and signal flares. Wind tunnel tests are said to have shown the Condor's controls to be adequate for all conditions in which the ship may be placed either accidentally or purposely.

With the present fuel capacity the maximum cruising range is five hours at a speed of 115 m.p.h. Unless flights of more than 2½ hours' duration are scheduled in operation, this will give a 50 per cent margin of safety in normal flights.

The choice of two engines is justified also by economic considerations, the manufacturers point out. Engines today are the greatest item in the maintenance cost of airplanes, and the cost of engines does not increase nearly as rapidly as the power. By reducing the number of engines from three to two, it is claimed that the operating cost, so far as engines are concerned, is reduced by more than 30 per cent.

The framework



View of the Condor's cabin, showing arrangement of seats in compartments, which may be closed off into private sections

Biplane, Built for T. A. T., 635 Hp. Engines

*passengers with two pilots and
successfully flew with 23
ducted on July 21.*



*The Condor in flight tests in July carried 20
passengers. View of plane over Long Island*

of the Condor is entirely of metal, and such parts as the wing beams and ribs are also of metal. Cloth covering is used, the reasons given being that it is light, durable and easier to repair.

In the design of the passenger accommodations every effort was made to provide the utmost comfort. Individual seats with high backs are installed in the cabin. These chairs are large and comfortable, yet so light that "they may be lifted with one hand by a small child." The high backs taper to padded headrests. These chairs are upholstered in top-grain leather which is both beautiful and durable. They can be adjusted to any desired degree of inclination by merely leaning back. The cost of these chairs is \$140 each.

The problems of ventilation have been worked out thoroughly. In the first place, the cabin provides a comparatively large cubic space for the number of passengers to be carried. Secondly, ventilators are so designed that they will admit plenty of fresh air without draft, and thirdly, steam heat is employed to control the temperature.

The cubic space of the Condor's cabin is 865 cu. ft., or more than 48 cu. ft. per passenger. The floor area is 138 sq. ft., or more than 7 sq. ft. per passenger. The height of the ceiling is 6 ft. 3 in., which is sufficient for even quite tall persons, and is said to be more than ever before provided in an airplane. Chairs are arranged to seat three passengers abreast, and there is a wide aisle, permitting passengers to move about.

The ventilators admit air through the roof of the plane and can be regulated as desired. The air is directed to flow along the ceiling, with a view to protecting passengers from drafts. One is located in the pilot's compartment, one in the main cabin, and one in the lavatory.

Steam heat has

the advantage that it does away with the possibility of combustion gases leaking into the cabin. Diminutive radiators, weighing less than 1 lb. each, are located beneath openings in the floor. Steam for these heaters is generated in small boilers mounted on the exhaust manifolds in the engine nacelles.

The engine nacelles are built up from the lower wing, above the landing gear, which tends to reduce the engine vibration transmitted to the fuselage. Three-bladed propellers are used, which are said to be smoother in operation than the two-bladed type. With a geared engine and the consequent low propeller speed, the three-bladed propeller is said to be as efficient as the two-bladed design.

The cabin is divided into three compartments, separated from each other by arches. Each compartment accommodates six passengers. If desired by the operator, any compartment may be shut off from the other two by means of doors, giving the effect of private sections. The compartments are attractively carpeted, and the interiors are finished in light-weight paneling upon which the grain of natural wood had been reproduced. Over each seat there is a rack in which light articles may be placed.

There is a window beside each row of seats and, although the windows are fewer in number and smaller than might be expected, they are said to permit complete vision for all of the passengers. It is stated that by reducing the glass area, the sound-proof and heat-insulating qualities of the cabin are improved. Non-shatterable glass is used throughout.

Sound - proofing and vibration damping of the fuselage are made possible by an innovation in construction. The cabin is double - walled, with a 3-in. air space between the inner and outer walls, and



Above is a view of the Condor's cabin under construction

the lining of the wall consists of sound and shock-absorbing material.

Provision is made for the installation in the main cabin of a private compartment with four sleeping berths, each 28 in. wide. For night flying on air routes in the future the Curtiss Condor can be converted entirely into a sleeping plane with 12 full-size berths. On the order of the operating company, space can be arranged for the installation of a desk set, buffet and a refrigeration system.

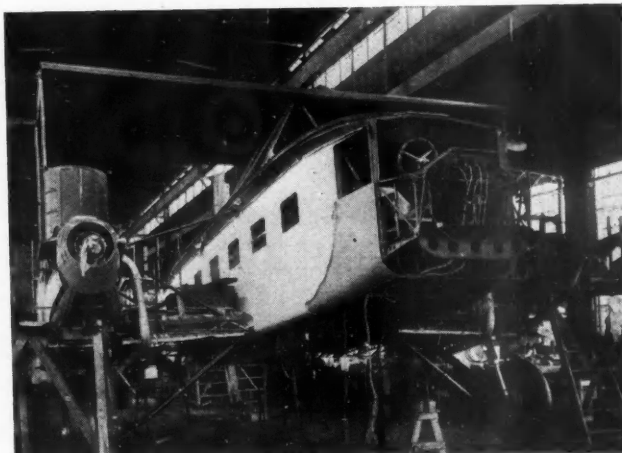
All baggage is carried in two metal-lined compartments, one in each outboard engine nacelle aft of the gasoline tanks. This leaves all available cabin space for the use of the passengers, and also makes it impossible for baggage to be spilled into the passenger compartments, as sometimes happens when baggage is carried in the rear of the main cabin.

Each plane is equipped with a lavatory, including wash basin, toilet, towel racks and mirrors.

Pilots enter their forward compartment through a door in the floor and without passing through the passenger cabin. The ladder for this entrance folds back under the ship when not in use. The courier is seated in the ante-room behind the passenger cabin.

The radio equipment, installed by the Radio Corporation of America, consists of a 100-watt combination telephone and telegraph transmitter, operating on 600 to 950-meter wave lengths. Its source of power is a small motor-generator, which draws its current from the standard landing light batteries of the plane. The receiving equipment is designed for frequencies used

Condor is the first ship in which this equipment has ever been installed.



One of the steps in the construction of the Curtiss Condor is shown above. Note that the metal siding on the cabin has an additional fabric covering

Specifications of the Condor Transport

General Characteristics:

Wing loading, lb. sq. ft.	11.50
Power loading, lb. sq. ft.	14.47
Aerfoil section	C-72

Dimensions:

Length, overall	57 ft. 1 in.
Height, overall	16 ft. 6 in.
Span overall	91 ft. 8 in.
Chord, upper	108 in.
Chord, lower	108 in.
Gap	126 in.
Stagger	0
Incidence, upper	1.5 deg.
Incidence, lower	1.5 deg.
Dihedral, upper	0 deg.
Dihedral, lower	3 deg.
Sweepback, upper	0 deg.
Sweepback, lower	0 deg.

Areas:

Wing, incl. ailerons	1512 sq. ft.
Ailerons, total	241.4 sq. ft.
Horiz. tail	145.8 sq. ft.
Vert. tail	76.6 sq. ft.
Elevators, total	47.6 sq. ft.
Rudders, total	53.0 sq. ft.

Powerplant:

Engine, GV-1570 Curtiss Conqueror No. 2	
H.P. total	1200 at 2400 r.p.m.
Propellers, Curtiss Reed "R" type—Diameter 13 ft., 3-blade	
Cooling system	Vertical interplane radiators
Fuel capacity	278 gal.

Weights:

Empty, with 298 lb. water	11,352 lb.
Useful load	6,026 lb.
Crew	510 lb.
Fuel and oil	1,916 lb.
Pay load	3,600 lb.
Gross weight	17,378 lb.
(Pass., 3060; Bag., 540)	

Performance:

High speed	139 m.p.h.
Landing speed	49
Cruising speed	116
Rate of climb, ft. min.	870
Service ceiling, ft.	17,000
Absolute ceiling, ft.	19,200



The pilot's cabin shown above is designed for dual control and unobstructed vision at all times

by the marine stations of the United States Coast Guard and the stations of the Airways Division of the United States Department of Commerce.

The entire equipment for sending and receiving radio weighs only 145 lb. and was developed by the Radiomarine Corporation of America to use a remote control system of trailing wire antenna. The present Curtiss

THE Department of Transport of the German government is at present considering the possibility of basing automobile taxes on the mileages covered by the vehicles during the tax period. The problem involved is whether it is possible to fit the vehicles with simple and reliable instruments which cannot be tampered with by the taxpayers.

General Motors New Antwerp Plant To Be One of *Best in Europe*

*Production of cars is expected to be doubled immediately
upon completion of new assembly unit, which
has 608,333 sq. ft. of floor area*

By W. F. BRADLEY

WITH General Motors removal, early in September, into a new and enlarged plant on the Scheldt River, at Antwerp, an important step will be made in the company's manufacturing program in Europe. The new plant, under the general management of E. C. Riley, will be one of the biggest and the best equipped in Europe, and will replace an existing factory in Antwerp, which has become too small for requirements.

The river frontage, which is 935 ft. long, enables ocean-going steamers to unload direct into the factory. The total floor area is 608,333 sq. ft., comprising

very elaborate enameling and chromium plating plants included in the present plan for the ground floor, also restaurants for the office staff and workers. The two main assembly lines are to be on the upper floor. The body trimming shops and the nitro-cellulose painting plants are on this floor, the ovens being laid out in a zig-zag manner with rails running through them, in order to save space.

On reaching the end of the assembly line, the cars will be at the head of an inclined runway leading to the test track surrounding the factory.

At the present time the office staff employed by General Motors at Antwerp is 500, the workers varying from 1200 to 2000, according to season. An eight hour day is maintained, this being in two periods of four hours with half an hour break for a meal. All the workers are Belgian, in accordance with General Motors principle to employ local labor; only a few heads of departments are American.

Skilled mechanical labor is plentiful in Belgium. While there has been an important custom-built body trade in Belgium for many



Above is a view of the
incompleted main en-
trance of the General
Motors plant in Ant-
werp, Belgium



At the left is pic-
tured the partially
constructed convey-
ors for the main as-
sembly lines in the
Belgian plant of
General Motors

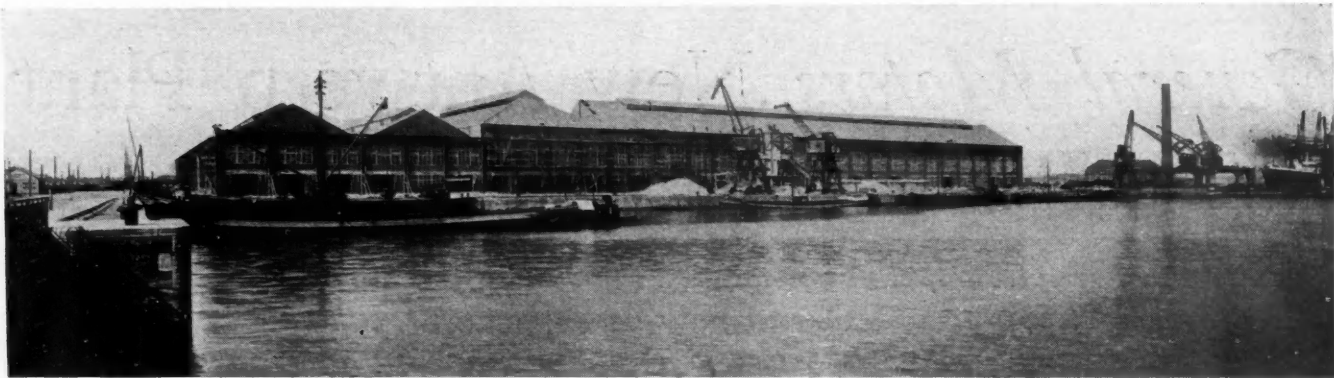
304,427 sq. ft. of factory on the ground floor, with 29,062 sq. ft. of office room, and on the first floor 245,147 sq. ft. of factory space and 29,697 sq. ft. of offices. The building is steel and brick construction, built on ground belonging to the city of Antwerp, for which a long lease has been obtained.

Immediate capacity is planned for 250 cars a day, which is double the production of the present factory. Storage room for 300 cars on the ground floor is provided.

On being unloaded from the steamer the boxed cars will be placed on the ground floor, where they will be opened and the parts carried to the assembly lines on the upper floor by two travelling overhead cranes. There are



Above is a corner of the enamelling department



General Motors' new plant on the River Scheldt, Antwerp, Belgium, as seen from across the river. The unit is expected to be completed and in operation by September

years, the skilled workers of this industry are not found suitable for American methods of body production. As a consequence, most labor is recruited from the workers trained in the furniture trades. The entire plant and equipment has been built with European labor and material on an American plan.

The amount of assembly depends on the models. The Chevrolet, which is the biggest production job, is completely assembled. Side rails are assembled and riveted, springs fitted; the motor is received without its accessories, transmission and rear axle are separate units when received and all enameling is done in the plant. For some of the models having a smaller output a lesser amount of assembly is carried out.

Body Unit Complete

The body building department is particularly complete. Panels are received in boxes and are assembled, riveted and welded. The whole of the upholstery is made at Antwerp and much of the body material is bought in Europe. All paint work is done in the factory, the paint being stored in underground tanks, mixed in an outside building and pumped up to the paint shops. The enameling installation is very elaborate and is believed to be the best of its kind in Europe. European tires are fitted, the make most extensively employed being Englebert.

Electricity for power and lighting is supplied by the city of Antwerp at 6650 volts and is stepped down to 220 volts. There is a boiler house containing four boilers supplying steam for processes, for heating and for operating compressors.

With the new plant General Motors will cover an increased territory, the countries comprising Belgium, Holland, Hungary, Jugo-Slavia, Bulgaria, Roumania, Greece, Albania and Italy. Germany and Scandinavian countries each have their own assembly plants, while France receives its cars direct from the United States, through storage stations at Havre and at Marseilles.

It is believed that the buildings at present owned by General Motors will be occupied by Willys-Overland and used by them as an assembly plant.

While Belgium is important as an assembling and distributing center for the whole of Europe, the market in that country is also active. Last year 20,000 cars were sold in Belgium, while this year it is expected that the number will increase to 30,000, of which 60 per cent will be American. Last year Belgium makers exported 3365 cars, of which 619 went to Great Britain, 541 to Holland, 284 to Germany and 237 to Switzerland.

During the last few years the home manufacturers have been reduced in numbers. The most important is

Minerva, at Antwerp, producing sleeve valve passenger cars and having an auxiliary organization known as Auto Traction, producing trucks, tractors and coaches.

The F. N. Company (Fabrique Nationale) at Liege, is just completing a new factory having a covered area of 592,769 sq. ft. and a total ground area of 660,000 sq. ft. This firm is producing passenger cars and also has a very flourishing motorcycle business.

The Belgian Excelsior Company ceased production a few weeks ago. Nagant and Imperia have consolidated and have also been joined by the Voisin Company of Paris. Under arrangements just being completed, the Voisin Company will assemble the four and six-cylinder single sleeve valve Imperia in Paris.

Several Belgian makers formerly building passenger cars have transferred their activities to trucks, in which branch there has been no American competition, up to the present. Among those having done this are Miesse, Bovy, Brossel and Pipe. American makers, however, are now showing some interest in the Belgian truck business and among the schemes is one for marketing an American six-wheel truck chassis with a Belgian charcoal gas engine.

Seek Molding-Sand Substitute

THE removal of molding sand from the surfaces of steel castings requires considerable labor, especially in the case of large castings, for which reason the Nadeshdinsk steel foundry in the northern Ural district, Russia, has been searching for other materials for the molds, which can be more easily removed.

Experiments with quartz, finely ground and screened, did not give good results, even though cleaning of the castings was facilitated. On the other hand, very satisfactory results were obtained from the use of ferro-chromium ore containing from 37 to 40 per cent of Cr_2O_3 . The internal surface of a mold for a large gear wheel weighing about 4 tons, was covered with a layer of ground ferro-chromium ore of from $\frac{3}{8}$ to $\frac{5}{8}$ in. in thickness. Otherwise all of the molding and casting operations remained the same. After pouring it was found that the chromium mineral had become agglomerated and formed a solid crust. This crust could be readily broken by means of hammer blows and then exposed a perfectly clean and smooth cast surface.

Analyses were made to determine whether the chromium mineral had any deleterious effect on the casting, and it was found that the chromium content was only from 0.02 to 0.08 per cent, according to a report in *Stahl und Eisen*.

Automatic Transmission Employed In Diesel-Engined Locomotive

Robertson variable gear set, with spring-loaded governor, is in production for use on a 30-hp. power-plant in railroad service in Great Britain.

A 30 hp. Diesel-engined railway locomotive that has been put in production by a well-known British firm (Kerr, Stuart & Co.) has the Robertson automatic variable speed transmission concerning which, as applied to cars, preliminary notices appeared in English motor journals last year.

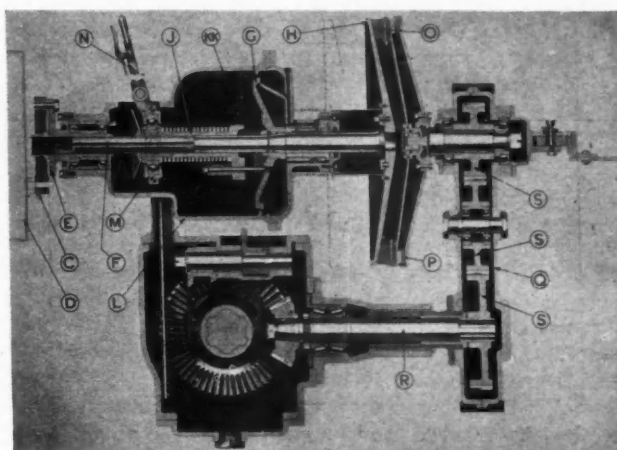
In the locomotive, the engine torque is transmitted through the Robertson gear to a countershaft by a train of helical gears and thence through a reversing shaft and a 1 $\frac{3}{4}$ -in.-pitch roller chain to the front axle, the latter being coupled to the rear axle by another roller chain. The variable gear is shown in part section in Fig. 1. It will be seen that the drive is taken from the engine flywheel through a flexible coupling *C* and a sleeve *E*, the latter being free to slide on a driving shaft *F* carrying a cam disk *G* and a metal friction cone disk *H*. A sleeve *J*, splined internally and free to slide on the cam disk shaft but rotating with it, carries spring-loaded governor weights *KK*, the whole rotating in an oil-tight casing *L*. A collar *M* is located on this sleeve by means of a ball bearing and is controlled by a hand lever *N*. Two annular friction rings *O* and *P* are carried at the top of the gearcase *Q* suspended on a shaft *R* below the cam disk shaft. Carrying the train of helical gears *SSS* that transmit the drive from the cam disk shaft to the countershaft, the gearcase *Q* is free to oscillate about the countershaft *R* in a vertical plane across the face of the friction disk *H*. One of the two friction rings—viz. *O*—is a floating ring, and makes contact with the friction disk *H*; the other, *P*, is attached to the top shaft of the train of gears.

The friction ring *P* transmits the drive already picked up by the friction ring *O*. Pressure for driving contact between the friction disk and the floating ring is obtained from the centrifugal force generated by the governor weights *KK*, resisted by the reaction through the helical gears.

The action of the gear is as follows: When the engine is idling and the locomotive stationary, the centrifugal force generated in the governor weights is insufficient to overcome their spring; therefore, there is nothing to prevent cam disk *G* being drawn back toward the

engine flywheel, so that cone disk *H* is entirely out of contact with the friction ring *O*.

It will be observed that by the action of the hand

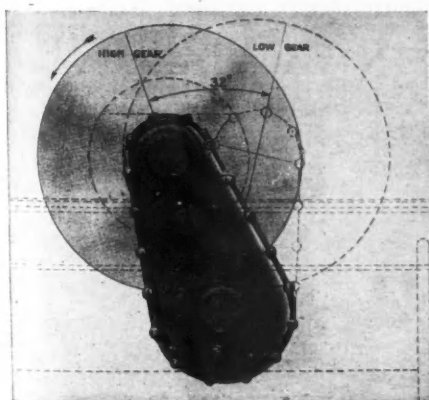


Section view of the Robertson gear. References are explained in the accompanying article

lever on collar *M*, the position of the member carrying the governor weights is altered; the reason for this will be apparent later.

In the idling position with the locomotive stopped, the hand lever withdraws the collar *M* as far toward the engine as it can go, bringing with it the friction disk *H* and rendering the gear entirely free. The hand lever moves alongside a notched plate, so that it can be set in any one of a variety of positions, and when the driver wishes to start he moves it to one of the notches, which has the effect of bringing the friction cone disk *H* into close proximity with the floating friction ring *O*; but so long as the engine is idling the governor weights do not swing out and the disk and friction ring do not make actual contact.

But when the throttle is opened and the engine accelerates, the governor weights—overcoming the resistance of their spring loading—swing out and bring pressure to bear upon the friction cone disk *H*, causing the latter to press heavily upon the friction ring *O*. The disk *H* therefore tries to drive the ring *O*, but the inertia of the locomotive, and the vehicle or vehicles attached to it, tends to hold shaft *R* stationary; in consequence, the helical gears planet around shaft *R*, carrying with them their casing *Q* and the two friction rings, so causing contact between the ring *O* and the disk *H* to occur on a smaller diameter of the latter. This has the effect of lowering the transmission ratio, and when a sufficiently low ratio has been reached the inertia of the load is overcome and the locomotive moves forward.



End view of Robertson automatic variable speed transmission gear

idling and the locomotive stationary, the centrifugal force generated in the governor weights is insufficient to overcome their spring; therefore, there is nothing to prevent cam disk *G* being drawn back toward the

As soon, however, as the vehicle moves forward, the torque reaction decreases and—owing to the angle of the friction ring *O*, assisted by the speeding up of the engine and the further swinging out of the governor weights—the friction ring commences to climb back toward the major diameter of the friction disk *H*, thus increasing the ratio. As speed increases this process continues, until the friction ring comes back to a concentric position and the whole gear drives like a single-plate clutch.

When a rising gradient has to be climbed, one that is beyond the power of the engine to take on direct transmission, the increased torque reaction tends to make casing *Q* planet around shaft *R* again, and since the lowering of the engine speed will cause the centrifugal force in the governor weights to diminish, this planeting action will be encouraged and the gear ratio will be lowered until the increase in engine speed and the lowering of the gear ratio establish a balance.

It will be observed that the friction ring *O* runs quite freely on a ball race and that the drive is picked up by the friction ring *P*. The purpose of this is to enable the ring *O* to turn always, irrespective of the amount of power to be transmitted; any slip that takes place occurs at ring *P*. For that reason, the coefficient of

friction of the ring *P* is lower than that of the ring *O*, which prevents grooves from being ground in the latter ring. Actually, it is stated, when the drive is first taken up, ring *O* runs at a steady speed and the picking up of the drive takes place entirely by means of ring *P*.

By altering the relative position of the governor weights and the cam disk *G*, the engine speed at which the gear will automatically put itself into various ratios is altered up and down the scale; this is the object of the notches locating the hand lever in various positions. In the case of a locomotive, it is found that once the best position of the lever has been found for a given service it does not need to be varied, except when the driver leaves the locomotive with the engine running. The reverse is obtained in this case, too, by means of a dog clutch, which engages, alternatively, a right or left-hand bevel gear.

A point to be noted in conclusion is that in every position of the hand lever the full automatic action of the gear is available. For a private passenger automobile two notched positions would probably suffice, one for town driving and hilly country and the other for undulating roads in open country. For trucks, with their greater variations of load, three or even four positions might be provided.

Seaplane Tested for Schneider Cup Race

PRESENTED herewith are two views of the Mercury, the racing seaplane which Lieutenant Alford J. Williams, U. S. N., is testing on the Severn River, near Annapolis, Md., for the Schneider Cup Races, the international speed contest to be held next month at Cowes, England. Definite announcement of the entry of the plane has been made, and it will be shipped abroad next week in time for tuning before the race on September 6.

The Mercury measures 30 ft. from nose to rudder and has a wing spread of 23 ft. with wing load in excess of 30 lb. per sq. ft. The fuselage, wings and fixed tail

surfaces are of wooden construction, while control surfaces and floats are of metal. All bracing, except the float struts, consists of steel tie rods of streamline section.

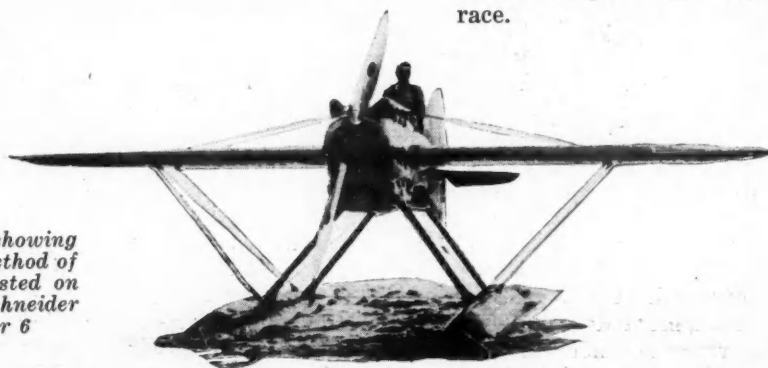
The Mercury is powered by a Packard 24-cylinder engine, capable of developing from 1100 to 1350 hp. The cylinders are arranged in four banks of six each, with carburetors and intake manifolds located in the vertical V between the upper and lower banks, making the engine bloc fit the streamline form. Engine cooling is effected by water passing through the radiators located in the wings and floats.

During the first trials held last week the plane was taxied on the water, without rising, at a speed of 110 m.p.h. Lieutenant Williams expects the ship to lift into the air at a trifle higher speed and better the record of 318 m.p.h. established last year. Recent reports of competitors' trials at Calshot indicate that a speed of 330 m.p.h. has been developed by the S-5, England's entry in the 1927 race.



Above is shown a side view of the Mercury, drawn up to the float upon which can be seen the starting device immediately in front of the propeller hub. This picture shows also the unique construction of the fuselage, which has longitudinal fins designed to give directional stability at high speed

At the right is a front view of the Mercury, showing the comparatively small wing spread and the method of bracing used. The racing seaplane is being tested on the Severn River near Annapolis, Md., for the Schneider Cup Races to be held in England, September 6



Just Among Ourselves

Has the Inventor's Returns Improved in Modern Times?

THE inventor has always been notorious for his inability to get adequate financial return from the best of his brain-children. The average business man is likely to lay this result to the fact that the inventor "is a poor business man." The inventor, on the other hand, probably feels in a good many cases that the business man just has taken an unfair advantage of him. The automotive industry today probably is as much dependent for future success on efforts of inventors as any industry at any time, both in its engineering and production divisions. It is interesting to speculate as to whether the inventor has a better chance of getting what he thinks he has coming to him under modern conditions than he had in prior eras.

* * *

Ethical Danger Lies in Developing Others' Ideas

OUR preoccupation with this topic is generated by some correspondence with Robertson Matthews of Canada, who apparently has given a great deal of thought to the matter. Mr. Matthews feels quite definitely that the inventor usually comes out at the wrong end of the tunnel and that he has even less chance in modern industry than he had before. In taking an inventor's ideas without compensation, for example, he feels that "stealth, cunning, cajolery and coercion, all are still considered good business, even by men who would not care to exhibit a family tree recently heavy with cattle rustlers." That's a bit strong, we think, but there is no getting away from Mr. Robertson's statement

in which he says that:

"Ideas are hard to preserve and realize upon as personal property. If a salesman goes into a store to sell soap, and fails of a sale, he goes away with what he took in. But if the salesman goes into an office with an idea and fails of a sale, he leaves value behind him with no legal claim for remuneration. He leaves his listener at least with a new slant." That is where the real ethical danger lies, as we see it. That new slant gradually may become a part of a whole skein of thinking on the part of the listener, so that the final result of his thinking, months later, by a very little bit of rationalizing to which all of us are only too prone, easily can be traced to a different and more personal source and the real originator of the inspiration conveniently forgotten.

* * *

Industry Needs Assurance of Strong Moral Character

Mr. Matthews points logically to the necessity for economic and organization freedom on the part of an inventor if he is to be more than a "technical mechanic." He shows how difficult that freedom is to obtain either inside or outside a modern industrial organization. We agree with this estimate of the difficulties, but feel that the real problem, from the standpoint of industry's management, is the necessarily intangible character of the inventor's program when he first sits back to let his vision range. It is easy to grant the necessity for such unguided and unhindered mental roaming, if the inventor is to produce anything really new and valuable.

Industry must be wonderfully well convinced, however, of the moral fiber and character

of the inventor whom it places on the pay-roll (directly or indirectly) purely on such a basis. It is only the very exceptional man who is imbued so sincerely with his scientific mission as to keep his mind on his work constantly and consistently when he is economically independent for the first time and when he has not even a general schedule of activity and responsibilities agreed upon in advance.

There are such men to be sure, but management has found by experience that they are few and far between.

* * *

Inventive Science Includes Manufacturing and Marketing

AS to the inventor failing to get his fair share of the rewards accruing from his inventions, there seems to us to be only one practical way out: that is to visualize the inventing business as having two sides, just as other businesses have two sides, namely, manufacturing and marketing. A good inventor, desiring to devote his life to this activity, owes it to himself to learn and study the best methods of marketing his product to the end that he may become the fully rounded man that he must be if he is to be successful in his chosen vocation. This education may be able to rest with ability to pre-judge the moral characteristics of men before doing too much business with them; certainly such ability is far more valuable to the average business man than all of the legal safeguards ever thrown around business transactions. This, it seems to us, is an integral part of the inventing profession, just as ability to sell his ideas to others is an integral part of the average engineer's job in modern industry.—N.G.S.

Sunbeam Enters Bus Field With Powered by Six-Cylinder

*Powerplants for both the single
the same design, differing
Six develops 142 b. hp.*

By M. W.

THE Sunbeam Motor Co., Wolverhampton, England, has entered the bus field with two chassis models, both of which are now in production and are known as the S. M. C. One is a six-wheeler capable of taking double-deck bodies with a seating capacity up to 67, and the other a four-wheeler on similar lines for single-deck coach or bus bodies, seating up to 32 passengers.

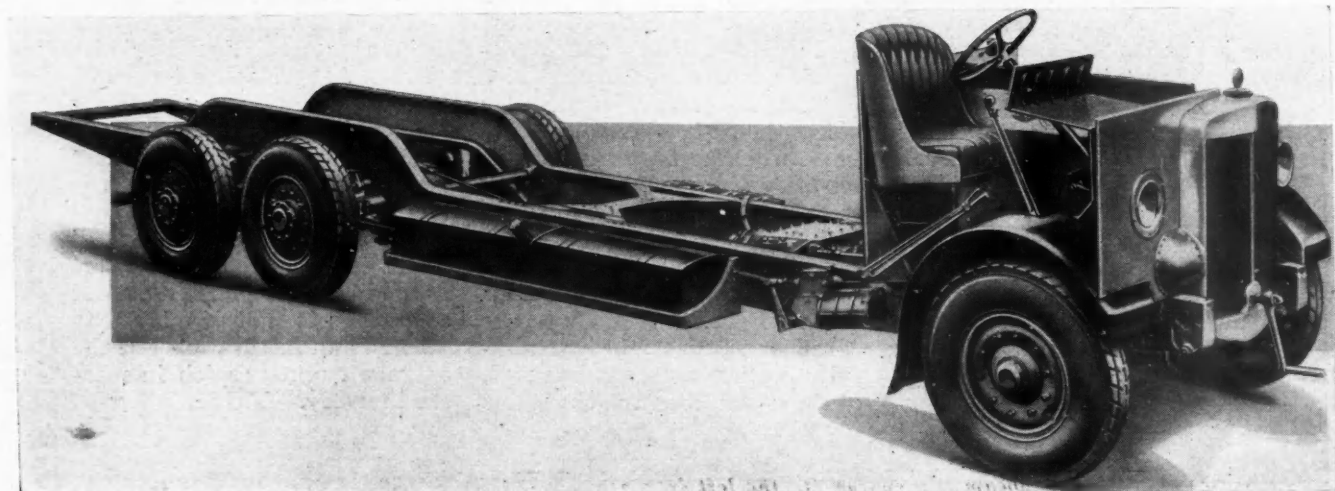
The engine is of the same design for both models, differing only in cylinder bore; it is a six-cylinder with overhead valves arranged in two rows at an angle of 45 deg. in relation to, and on each side of, the center line, so affording a combustion chamber of hemispherical shape with two spark plugs set vertically at the center between the two valves. Pushrod operation is used, and to make one camshaft serve, the rods for the inlet valves (on the right-hand side) run diagonally through the cylinder block to the camshaft on the left, the pushrods for the exhausts being vertical as usual. Steel and phosphor-bronze front-end gears are used, with an intermediate wheel between the crankshaft and the camshaft gears, this idler wheel having its spindle eccentrically mounted to afford a means of tooth mesh adjustment. Set-screws in the rocker ends provide clearance adjustment, these screws having spherical ends in contact with the pushrods.

The bore and stroke of the six-wheeler engine is 110 x 140 m.m. (4.34 by 5.52 in.), giving a piston displacement of 477 cu. in.; the four-wheeler engine has a bore of 100 m.m. (3.94 in.). The larger engine develops 70 b.hp. at 1000 r.p.m. and 142 b.hp. at 2400 r.p.m.

Aluminum is used for the crankcase, which carries the separate cast-iron cylinder block surmounted by

two detachable heads, one for each three cylinders. This arrangement has been adopted because of its appeal from the operator's standpoint. The crankshaft, machined all over from 40-ton carbon steel, runs in seven bearings and is drilled for pressure lubrication from end to end (front to rear bearings) with seven oil leads from the bearings into the bore, so that in the event of a lead becoming choked the lubrication of the adjacent bearings shall not be impaired. Case-hardened and ground end-thrust washers are located alongside the front journal bearing. The connecting rods also are machined all over and have white-metal run directly into the big-ends; the piston pins are secured by pinch bolts. Zephyr bi-metal pistons are fitted, with aluminum heads and steel skirts, two compression rings and a scraper ring.

Engine lubrication is on the dry sump system, the oil supply being carried in a 4½-gal. tank, secured to the right-hand side of the crankcase in such a manner as to make the means of attachment form the joint between crankcase and tank. Two pumps are provided, of course, the pressure unit drawing oil from the tank through a wire gauze filter and forcing it through an Auto Klean filter, projecting from the crankcase on the left, and thence to the distributor duct in the crankcase casting. A lead is taken to the overhead valve gear and distribution, and also to the



Perspective view of S. M. C. (Sunbeam) six-wheeled bus chassis

Four and Six-Wheel Chassis Overhead-Valve Engine

*and double deck models are of
only in cylinder bore.
at 2400 r. p. m.*

BOURDON

magneto driving gear. The latter, it should be noted, is at the rear end of the engine (the main distribution gear being at the front); the magneto itself is mounted on a bracket immediately over the starting motor, which has a Bendix drive to the steel disk forming the flywheel.

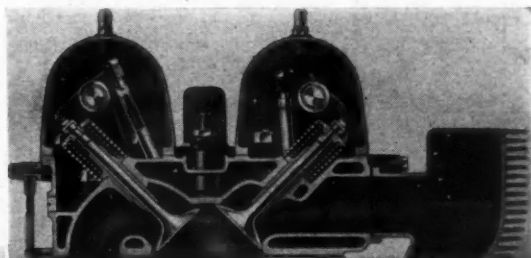
The excess oil from all parts drains into the lower part of the crankcase, where it flows through a coarse gauze to a sump trap, to be picked up by the scavenger pump and returned through another filter to the tank. It will be seen that four filters in all are employed; of these the tank filter and the Auto Klean can be cleaned without draining off the oil supply. An oil cooler is an optional fitting.

As the chassis has been designed for a forward driving position, the driver's seat being alongside the engine, all auxiliaries are arranged on the opposite side, viz., on the left; thus the water pump is in front of the distributor casing, the gen-

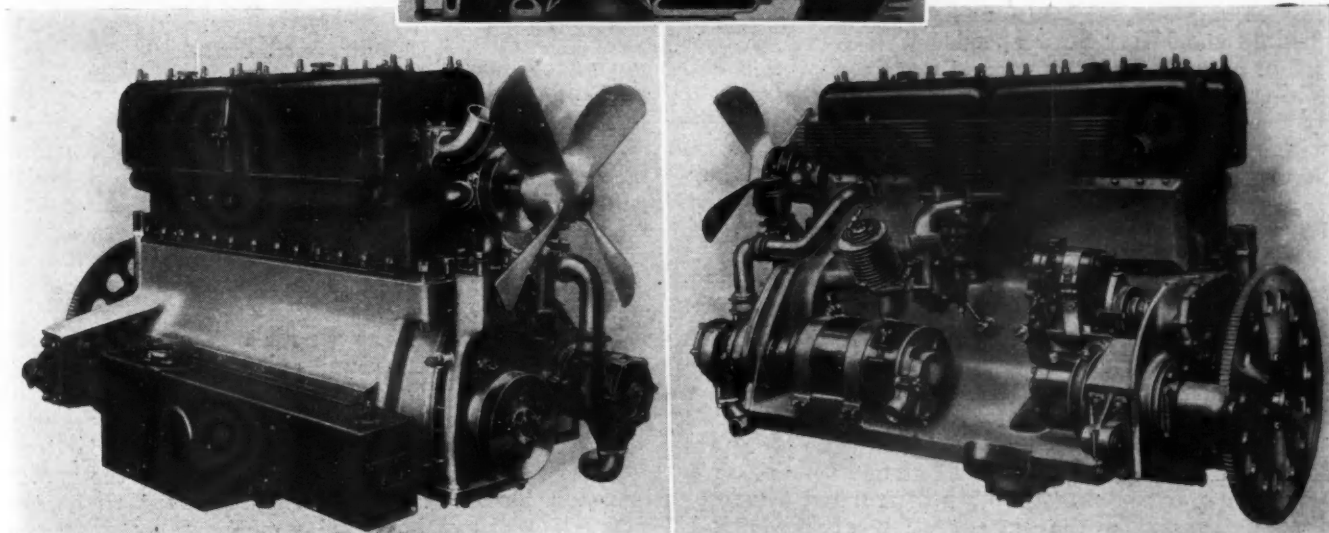
erator immediately behind it, the magneto and starting motor project forward from the rear end, the Auto Klean filter stands out diagonally above the generator, while the carburetor—a horizontal Claudel—lies clear of other units midway in the engine length on the same side.

The induction tract passes through the center of the cylinder block to the right-hand side, thus being water-jacketed on its way to the projecting (though integral) manifold. As inferred, the water circulation is by pump; its impeller is balanced against end thrust by the water being introduced on both sides. A four-bladed cast aluminum fan is fitted with eccentric adjustment for the V belt. Battery ignition is provided in addition to the magneto, the distributor being located vertically above the front of the distribution case. The two systems are entirely independent, for, as mentioned, each cylinder has two spark plugs.

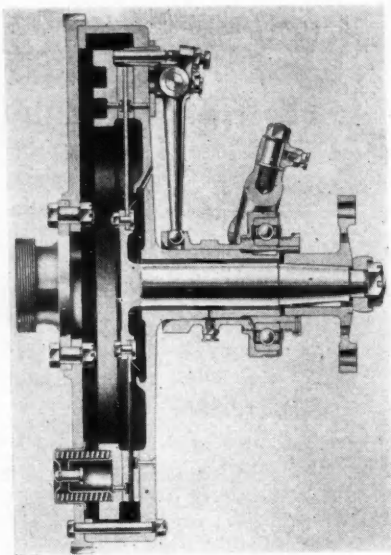
Two points concerned with the starting crank may be mentioned: the claws have three teeth to afford the best angle for the crank under all conditions for hand starting, while the front end of the handle shaft has an eye for coupling to the portable



Section view (left) of cylinder head and valve gear of Sunbeam engine



Right-hand side of Sunbeam bus engine (to the left in the above group), showing the oil tank of the dry-sump lubricating system. Left-hand side of Sunbeam motor bus engine (at the right of the group) shows how all accessories are mounted on the side opposite the driver's seat



Sectional view of clutch of new Sunbeam bus chassis

collector ring are fitted to prevent lubricant leaking from the throw-out sleeve from reaching the fabric facings. There is no pilot bearing, the driveshaft, with driven plate attached to its front-end flange, being centralized by two bearings in a rearward extension sleeve of the clutch housing. The clutch levers are compensated by means of a balance lever and take effect upon a ball bearing encircling the sliding sleeve that actuates the three adjustable multiplying levers.

All parts of the clutch and its casing are machined all over, and the whole or parts can be easily removed without disturbing either engine or gearset. The latter is a separate unit with a coupling shaft consisting of a pair of Simms-Jurid flexible shackles. Four speeds are provided. The casing is of cast-iron, with a flexible suspension from the frame at three points; two arms on the right-hand side are held by frame brackets with rubber-lined bushings, while one on the left is secured between large circular blocks of rubber.

The gear ratios are: First, 5.07; second, 2.77; third, 1.80; fourth, direct; reverse, 4.47. With a rear axle ratio of $7\frac{1}{4}$ to 1, the road speed on high at normal engine speed is $37\frac{1}{2}$ m.p.h. A clutch brake, which resembles a small single-plate clutch with adjustable spring pressure, is housed within the gearbox at the front end of the secondary shaft. Provision is made for driving a speedometer and tire pump.

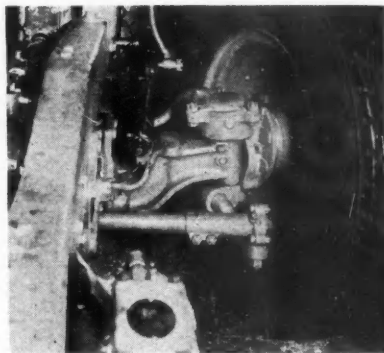
The transmission runs through an enclosed metallic joint lubricated from the gearset to a two-part propeller shaft with a two-row ball steady-bearing supported by a frame cross-member in front of the foremost universal of the rear section of the shaft. The casings of the rear axles are formed from steel drop forgings and carry worm drives below the centers. The differential is of the bevel type, and, like the worm shaft, is carried in ball bearings.

engine - starting equipment. The electric starter, it may be said, is an extra, supplied only upon demand, for the reason that many British operators prefer not to have one.

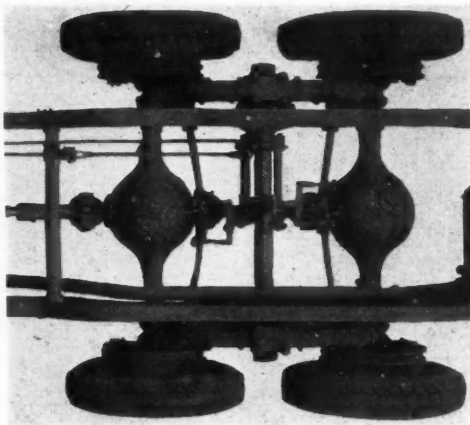
The clutch is of the single-plate type. The floating pressure plate is backed by 15 springs, each exerting 140 lb. pressure, the clutch being designed to operate with a coefficient of friction of 0.1 only. An oil thrower and

The mounting and general arrangement of the rear bogie follows orthodox British practice, which implies that the axles are attached to the ends of dual inverted half elliptic springs, the latter clipped at their centers to a trunnion box free to oscillate on bearings at the ends

of a tubular cross-member of the frame. No provision is made in the form of spherical bearings for the spring brackets on the axles to eliminate torsional stress of the springs when angularity occurs between two axles or between one axle and the frame. There is no differential between the two axles; this is in accord with British practice in general, though there are exceptions to this rule, notably in the case of the six-wheeled buses operated by the London General Omnibus Co., which have a third (inter-axle)



Rear view of front axle end of the Sunbeam bus chassis



Plan view of driving axles, rear suspension and brake-layout of Sunbeam six-wheel chassis

differential. The springs are of the Woodhead divided back-plate type, described in *Automotive Industries* of March 23, last; the front ones are 44 in. in length, $3\frac{1}{2}$ in. wide and have nine plates $\frac{3}{8}$ in. thick; the rear ones are $47\frac{1}{4}$ in. long when loaded and have 11 plates $3\frac{1}{2}$ in. wide, one plate being $\frac{3}{8}$ in. thick, the other 10 being $\frac{5}{16}$ in. in section.

Front wheel brakes are not fitted, but internal shoes apply to drums on each of the four rear wheels, the pedal operating them through a Dewandre vacuum servo, while the hand brake lever applies them directly. There are several unusual features in the brake layout. In the first place, the system is

devoid of shafts running across the chassis. Then each unit of the pair of shoes per drum is mounted on its own pivot, the pivots being connected by a short shaft having a right and left-hand thread respectively at each end. The shaft carries a worm wheel, which can be rotated by means of a worm and extended shaft from the outside of the drum. Brake adjustment is effected by rotating the worm, which separates or draws together the shoe pivots, leaving the operating cams alone.

The frame, which has a normal level when loaded of 24 in. above the ground, consists of two pressed steel side rails with a kick-up over the rear bogie, the depth of the channel being increased midway between the axles to enable the lower flange to extend down to the tubular cross-member carrying the spring trunnion blocks. At the front and rear there are channel cross-members and a particularly stout one of X shape in plan at the center. In addition there are three tubular cross-members. The side rails, of 3 per cent nickel steel, have a normal channel section of 11 by $3\frac{5}{32}$ by $\frac{5}{16}$ in.

The steering is of the Marles cam type, mounted immediately behind the front end of the frame. The ratio is 23.3 to 1 and the steering arms are of such lengths as to necessitate $4\frac{1}{4}$ complete turns of the steering wheel to move the front wheels from full lock on one side to full lock on the other side.

Fuel feed is by vacuum from a 46 Imp. gallon tank carried outside the frame on the right. The tires are 36 x 8 in. on all wheels; the turning circle is 62 ft. 6 in.; overall length, 29 ft.; overall width of complete

vehicle, 7 ft. 2 in.; the wheelbase is 18 ft. 6 in.; the track, 6 ft. $2\frac{1}{2}$ in.; the ground clearance, 5 in. under the rear axle and 10 in. at approximately mid-length of the wheelbase. The body space from the dashboard to the rear end of the frame is 26 ft. 6 in.; the chassis weighs 10,000 lb.

The four-wheeler follows the layout of the six-wheeler, apart from the use of normally arranged semi-elliptic springs for the single rear axle. With a wheelbase of 16 ft. 6 in. the overall length is 26 ft.

American Cars Lead in Egypt

SALES of automobiles in Egypt continue at a comparatively high level, according to a French consular report. The introduction of motor vehicles into the land of the Pharaohs is of comparatively recent date. In 1921, the number of cars imported was only 926, but with one exception there has been an increase in the imports every year since, and in 1927 the number reached 5623. Today automobiles are used in Egypt by all classes of the population.

When the first taxicabs were introduced in Alexandria in 1922, there was considerable skepticism as to their ultimate success, but since that time taxis have entirely replaced the old two-horse victorias even in the smaller cities, and numerous makeshift buses are in service in country districts and are very popular with the fellahs or native peasants. This method of transport has developed to such a degree that the railroad administration, feeling the competition, is taking steps to establish a motor service of its own.

Quite recently the imports have run ahead of the capacity of the market for the absorption of cars, and under the time-payment plan cars have been placed with persons of little financial responsibility who could not keep up their payments. These sales have served to give a wrong impression of the capacity of the Egyptian market, which for some time past has been limited by Egyptian economic conditions.

It will be seen from the tables that the United States holds an easy lead in the markets for both passenger cars and commercial vehicles. This is in part due to the fact that both Ford and General Motors have branches in Egypt for the supply of the markets of the Near East and the Balkan States.

Imports of automobiles into Egypt during each of the seven years since 1921, together with the American shares therein, are given in Table I.

Table I. Imports of Automobiles Into Egypt

	Total Imports	Imports From U. S.
1921	926	272
1922	1,248	546
1923	1,543	809
1924	2,968	1,790
1925	5,491	3,464
1926	4,762	3,421
1927	5,623	3,172

Imports from different countries during the eight months ending with August, 1928, and during the corresponding period in 1927 were as follows:

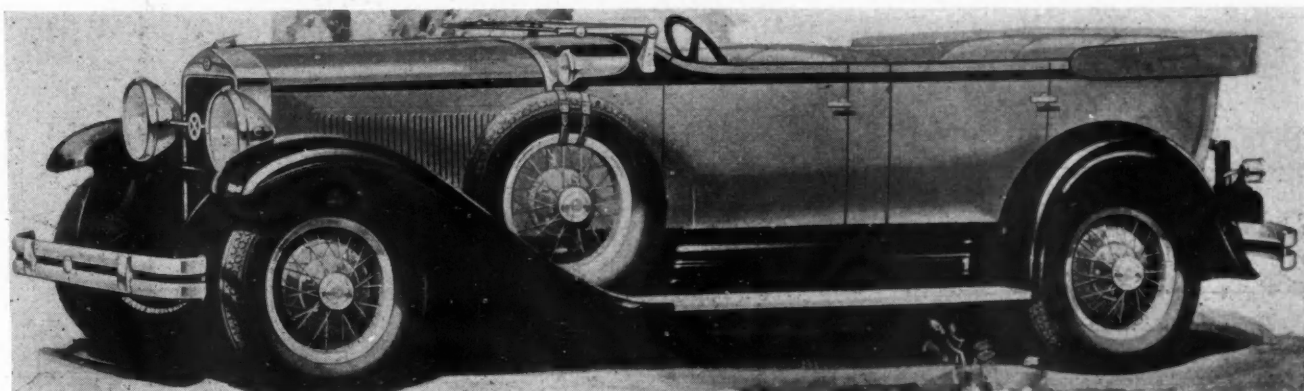
Table II. Passenger Car Imports According to Origin

Country of Origin	No.	1928	1927
		Value in Egyptn. Lb.	Value in Egyptn. Lb.
England	159	34,199	158
Belgium	35	10,255	20
France	243	54,345	368
Germany	16	2,356	19
Italy	291	60,184	634
United States	2055	302,877	1433
Other countries	2	420	2
Totals	2811	464,636	2634

During the same period, the following number of motor buses and motor trucks were imported from different countries:

Country of Origin	No.	1928	1927
		Value in Egyptn. Lb.	Value in Egyptn. Lb.
England	71	17,552	14
France	35	10,302	68
United States	620	57,034	304
Other countries	10	3,866	22
Totals	736	88,754	410

New Studebaker Tourer



The new Studebaker President Eight state tourer, recently introduced and selling for \$2,085

Nebraska Engineers in Official Tests Models Manufactured by Case

Fuel and consumption, drawbar loads and belt trials indicate both units conform to the provisions of the code established by the A. S. A. E. and S. A. E.

TWO additional reports of official tractor tests have been issued by the University of Nebraska Agricultural Engineering Department, covering tests on a Case Model L 26-40 and a McCormick Deering 15-30.

The Case Model L tractor, which is equipped with a four-cylinder 4 $\frac{3}{4}$ by 6 in. engine, gave the following results under test: In the maximum load test, which consists of one hour's operation under 95 per cent of the actual maximum load the engine will carry, the engine developed 40.01 hp. at 1099 r.p.m. and delivered 9.87 hp.-hr., per gallon of fuel. During this test the temperature of the cooling water leaving the jackets was 190 deg. Fahr., the atmospheric temperature being 61 deg.

In the rated load test, the engine developed 40.22 hp. at 1102 r.p.m., with a fuel efficiency of 9.76 hp.-hr. per gal. The cooling water temperature in this test was 183 deg. In the varying load tests, extending over two hours, the engine load was varied in steps between 0.595 hp. and 41.57 hp., the engine speed being maintained between 1154 and 1095 r.p.m. At the minimum load the consumption of fuel was at the rate of 1.342 gal. per hour.

In the drawbar rated load test, made on intermediate gear and over a period of 10 hours, the tractor developed 26.28 hp., the drawbar pull being 2855 lb. and the speed 3.45 m.p.h. In this test the fuel consumption was at the rate of 1.049 gal. per drawbar hp.-hr. The water

consumption was 0.13 gal. per hour, the cooling water being maintained at 185 deg. and the atmospheric temperature being 65 deg. Maximum drawbar load tests were made on all three forward gears. On intermediate gear the drawbar pull was 3427 lb. and the speed 3.25 m.p.h. (29.66 hp.); on high gear, 2645 lb. and 4.26 m.p.h. (30.08 hp.), and on low gear, 4555 lb. and 2.47 m.p.h. (30.02 hp.). The slippages of the driving wheels were 11.05 per cent on high, 15.65 per cent on intermediate and 21.91 per cent on low gear.

All tests were made with kerosene. Mobiloil A was used for lubrication. It took 3 $\frac{1}{2}$ gal. to fill the crankcase, and the actual amount of oil used during the tests, which lasted 58 hours, was 4 gal. of Mobiloil A and 1 $\frac{1}{4}$ gal. of Mobiloil B.

Before the official belt tests were run, the weighted air valve in the carburetor was given a few thousandths in. end clearance. About 5/32 in. was removed from the crown of the belt pulley. The weight of the tractor with operator (as tested) was 5307 lb.

The McCormick Deering tractor tested, known as the 15-30 Model, is equipped with a four-cylinder 4 $\frac{3}{4}$ by 6 in. engine and has a rating of 22-36 hp. In the maximum load test the engine ran under 97 per cent of its actual maximum load capacity for one hour. It developed 40.66 hp. at 1050 r.p.m. with a fuel economy of 9.99 hp.-hr. per gal. This engine uses water injection



View of Case
Model L 26-40
tractor

of Tractor Hp. Ratings Approve New and McCormick-Deering

Rear view of Case
tractor with disk
harrow



3912.5 lb. at 2.88 m.p.h. (30.07 hp.) on low gear. Wheel slippages on the three gears were: 4.74 per cent on high, 5.21 per cent on intermediate and 6.63 per cent on low. The cooling water temperature was 168 deg. during the tests on low and intermediate gear and 170 deg. during the test on high gear.

and the water consumption during the one-hour run was 2.56 gal. (as compared with 4.07 gal. of fuel). The cooling water temperature was 177 deg. F. and the atmospheric temperature 76 deg. In the rated load test (one hour) the engine developed 36.15 hp. at 1055 r.p.m. with a fuel economy of 9.27 hp.-hr. per gal. and a cooling water temperature of 185 deg. In the varying load test (two hours), the load on the engine was varied between a minimum of 0.89 hp. and a maximum of 39.02 hp., the speed being maintained between 1062 and 1187 r.p.m.

In the drawbar rated load test (ten hours on intermediate gear), the tractor developed a drawbar pull of 2258 lb. at a speed of 3.78 m.p.h. (22.78 hp.), with a fuel economy of 6.18 hp.-hr. per gal., a drive-wheel slip of 4.56 per cent, a water consumption of 0.64 gal. per hour (as compared with 3.688 gal. of fuel) and a cooling water outlet temperature of 184 deg. In the drawbar maximum load test the tractor developed 2846.5 lb. drawbar pull on intermediate gear at 3.69 m.p.h. (23.03 hp.); 2190 lb. at 4.36 m.p.h. (25.46 hp.) on high gear, and

fuel in all tests. The lubricating oil used was Mobiloil "BB"; it took 2.625 gal. to fill the crankcase, and the amount consumed during the test (48.5 hours) was 2.375 gal. The total weight of the tractor with operator (as tested) was 7486 lb.

The reports on the tests of both tractors carry the following remarks:

"The tests herein reported were conducted with one carburetor setting which remained unchanged throughout the tests. This condition should be recognized when comparing this test with any Nebraska test conducted prior to 1928.

"In the advertising literature submitted with the specifications and application for test of this tractor we find no claims and statements which, in our opinion, are unreasonable or excessive.

"The results of this test indicate that the rating of this tractor does not exceed the provisions of the tractor rating code of the American Society of Agricultural Engineers and the Society of Automotive Engineers."

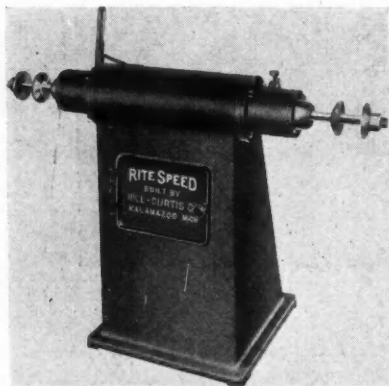


McCormick-Deering
15-30 tractor

NEW DEVELOPMENTS—Automotive

Rite-Speed Buffing Machine

THE polishing and buffing machine illustrated herewith is manufactured by the Hill-Curtis Co., Kalamazoo, Mich. The electric motor is mounted in the base, and power is transmitted from its shaft to the spindle by means of a multiple V-type belt, which makes it easy for the manufacturers to furnish the machine in any speed desired. Adjustment for taking up slack in belts is made from the outside of the machine without disturbing the motor mounting. Tapered roller bearings or ball bearings are furnished as preferred. An automatic motor starter with overload protection is standard equipment.



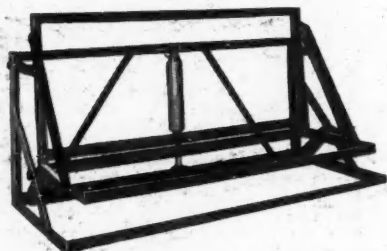
Rite-Speed polishing and buffing machine

The combination switch and brake shown on the photograph is a new feature on all Hill-Curtis Rite-Speed polishing machines. To stop the machines the operator pulls the lever forward to break the current connection and apply the brake. The brake is released and the motor started by reversing this operation.

Belts can be readily changed. By removing four cap screws on each side of the spindle, the entire spindle can be removed from the pedestal without disturbing the bearing mounting. The motor adjustment screw is then loosened, thereby taking the tension off of the motor pulley, and the belt slipped off the spindle.

Hickman Pneumatic Seat

GOWANDA FOUNDRY AND MACHINE WORKS, of Gowanda, N. Y., have developed a new seat for truck drivers known as the Hickman Pneumatic Seat. The frame of the seat and back is made in a single unit, which is suspended on a rocker arm. Attached to the rocker arm and the upper outside frame is a Westing-



Frame details of Hickman pneumatic seat

house Air Spring, which is the principal factor in eliminating throw or rebound such as occurs when an ordinary spring cushion seat is used. The air spring

has a two in. piston with a five in. stroke. The rocker arm is also braced against side sway.

Risley Break-in Oil

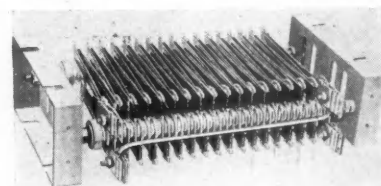
A REDUCTION in time of the run in period on the block for engine manufacturer's and higher speeds during the initial 500 miles for the car owner is claimed for Risley Break-In Oil, a product of Risley, Inc., 2415 Walnut St., Philadelphia. A small quantity of the compound is added to the crankcase oil and the mixture enters the closely fitted bearing surfaces. According to the manufacturer, tests have shown that engines broken-in at higher speeds are more sound than those driven at lower speeds.

It is further claimed that the length of the block test can be reduced 50 per cent and the cars can be driven 40 to 45 miles per hour with occasional spurts to top speed, for the first 500 miles. The product is being marketed through the car manufacturer's service and accessory departments and has been adopted by two producers for use in all engines.

Capt. D. Risley, Jr., the originator of the compound, states that it does not contain any abrasives, gasoline, kerosene, or other harmful ingredients.

Cutler-Hammer Resistor

A NEW "unbreakable" resistor with a continuous resistance element is announced by Cutler-Hammer, Inc., of Milwaukee, Wis. It is known as DUR-ristor and is claimed to be vibration - proof and unbreakable, non-corrodible, light and compact.



Cutler-Hammer Dur-ristor

The main body of DUR-ristor—the resistance element—consists of two continuous strips of a non-corrodible alloy.

They are ribbed on the sides as well as on the turning edges. A new method of supporting the strips, combined with the ribbing, permits the strips to expand and contract freely during temperature changes. Mica is used for insulation.

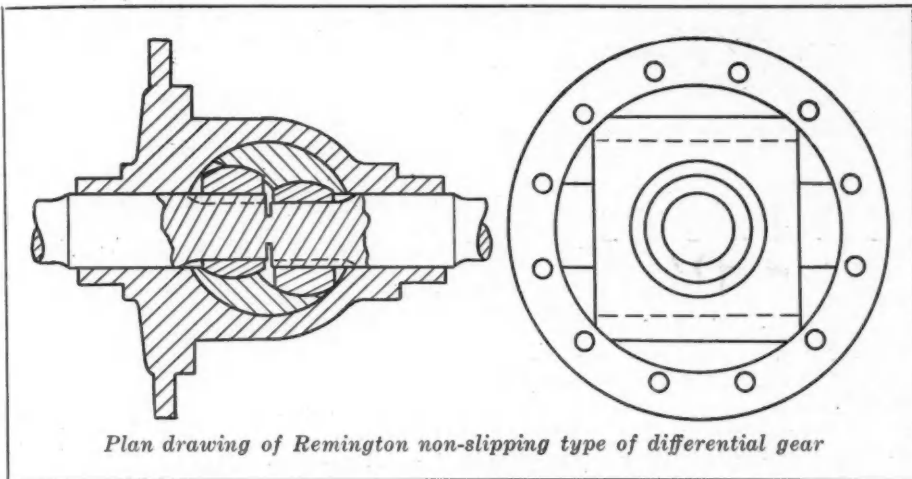
All DUR-ristors are of equal size regardless of ampere rating. The thickness of the resistance strip is the only part that varies in size with the ampere rating.

Remington Differential

A NEW non-slipping differential has been developed by the Remington Gear Co., 18th St. and Lehigh Ave., Philadelphia. It is based upon the property of an eccentric of relatively small throw, and will transmit power in one direction but not in the opposite direction.

As shown by the drawings herewith, the device consists of a single-piece cage which is formed with a

Parts, Accessories and Production Tools



Plan drawing of Remington non-slipping type of differential gear

flange to which the usual bevel driving gear can be bolted or riveted. This cage is bored out transversely to receive a two-part cylindrical crosshead. This crosshead is provided with sockets having internal spherical surfaces, into which fit spherical eccentrics that are splined to the differential shafts. If the cage is held stationary while one of the differential shafts is being rotated, the effect is to cause the crosshead to rock around its axis.

The eccentrics, of course, are not in balance, and in order to balance the complete assembly, each of the differential shafts may be provided with a cam-shaped projection outside the differential cage and directly opposite to the eccentric on this shaft.

In straight-ahead driving there will be no motion of the eccentrics relative to the crosshead. In turning corners, however, the outside wheel will run ahead of the inside wheel, and the eccentric connected to the outside wheel will then turn relative to the crosshead, which will

enable the eccentric on the other differential shaft to turn relative to the crosshead in the opposite direction. In other words, the outside wheel will be speeded up and the inside wheel slowed down the same amount. The drive is then taken on the inside wheel.

Owing to the impossibility of transmitting power from the crosshead to the eccentrics, there can be no spinning of one wheel when it loses traction.

A model of this gear unit may be seen at the Museum of Peaceful Arts, 24 East 40th St., New York City, N. Y.

Ball Bearings for Aircraft

A SERIES of ball bearings particularly adapted for airplane control mechanisms has been made available to plane manufacturers by The Fafnir Bearing Company, New Britain, Conn.

These bearings, known as the S Series, are of the single row radial type, with inch dimensions and narrow row widths. They are available in bores from $\frac{1}{4}$ to 1 in. as follows:

Bearing No.	Bore In.	Outside Dia. In.	Width In.
S1	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{7}{32}$
S3	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{7}{32}$
S5	$\frac{1}{2}$	$1\frac{1}{8}$	$\frac{1}{4}$
S7	$\frac{5}{8}$	$1\frac{3}{8}$	$\frac{9}{32}$
S8	$\frac{3}{4}$	$1\frac{5}{8}$	$\frac{5}{16}$
S9	$\frac{7}{8}$	$1\frac{7}{8}$	$\frac{3}{8}$
S10	1	2	$\frac{7}{8}$

This company has organized an aeronautical division and is making an exhaustive study of the bearing requirements of aircraft.

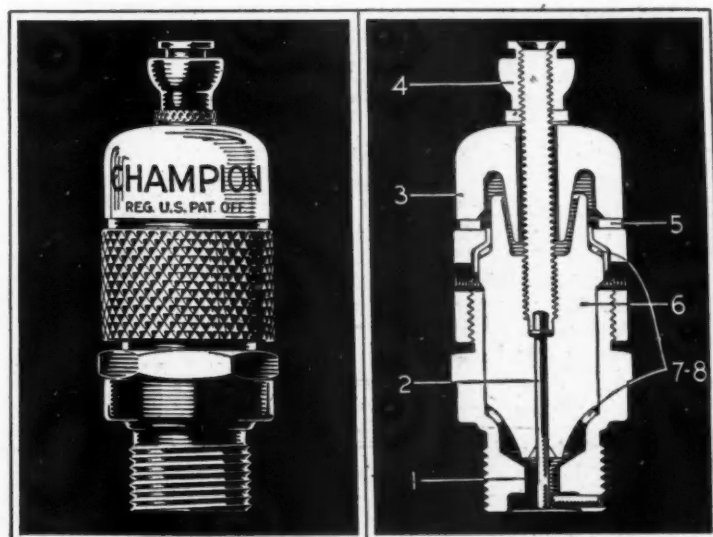
Champion Aviation Plug

THE Champion Spark Plug Co. announces that it now has in production a new spark plug for aircraft engines, known as the Champion Aero A.

The restricted bore of the Aero A spark plug makes possible an extra exposure of the center electrode and the use of a short projection of the primary insulator without in any way impairing the ability of the plug to withstand heat and oil.

Its secondary dome and the use of sillimanite for insulating material insure it against electrical breakdown. With Champion special analysis electrode wire a long gap life is assured. And with Champion's two-piece construction, including up-to-date formed gaskets, the plug will remain gas-tight.

The restricted bore construction makes it possible to apply this one plug to practically all radial air-cooled engines as well as to more modern high compression water-cooled aircraft engines. In spite of its ability to withstand tremendous heat, there is practically no tendency to foul.



The new Champion Aero A spark plug

Features indicated in sectional view are: (1). Restricted bore. (2). Special analysis electrode. (3). Secondary sillimanite dome insulator. (4). Welded steel terminal. (5). Copper seal. (6). Primary sillimanite insulator. (7) and (8). Molded copper gaskets

News of the Industry

PAGE 242

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NUMBER 7

July's Production Shows Recession of 5 Per Cent

PHILADELPHIA, Aug. 15—The recent announcement of the National Automobile Chamber of Commerce, giving the production of automobiles and trucks in the United States and Canada by its members as 327,650 units in July, showed a recession of about 5 per cent under the total for July, 1928. The entire industry, however, including the figure announced by Ford, produced about 500,000 units in July, putting last month about 20 per cent ahead of July, 1928, as far as the entire industry is concerned.

A recession of about 12 per cent was shown in the N.A.C.C. membership totals of production for July as compared with June of this year, however. This figure may be brought lower than 10 per cent when reports of manufacturers are made to the Department of Commerce within the next few days.

Factories have entered the third week in August with production in the industry as a whole at a higher level than last month and well in excess of August of last year. Opinion that the August production will approximate 550,000 units is not uncommon in the industry at present. Both Ford and Chevrolet are continuing their production at the high schedules indicated several weeks ago.

In announcing its July production of 180,804 units, Ford Motor Co. made known that every effort would be made to meet the demand for 200,000 units this month. Several other large manufacturers are showing increased activity, following introduction of new models and plant shut-downs for inventory and vacations.

Stutz Orders Mount

INDIANAPOLIS, Aug. 14—Figures for July announced by the Stutz Motor Car Co. today show that despite the fact that dealers' deliveries during July exceeded factory shipments, the number of unfilled orders on hand at the end of July were 69 per cent greater than orders on the books at the end of June, and 82 per cent greater than at the close of July, 1928.

Curtiss-Wright Is Official Now

NEW YORK, Aug. 13—Curtiss-Wright Corp. has been declared officially in existence by the board of directors, stock deposits of the various component organizations having been made in sufficient quantity to make the plan for their merger operative.

Farm Relief? Better Roads Are Suggested

WASHINGTON, Aug. 15—Congress can render no greater aid to the farmer than by speeding up road building, the American Automobile Association declared in a statement issued this week, pointing out that 23 per cent of the nation's motor vehicles are owned on farms.

Gemmer is Marketing New Two-Way Shock Absorber

DETROIT, Aug. 14—A new combination vacuum and air two-way shock absorber, under the name of the Gemmer controller, has been placed on the market by the Gemmer Mfg. Co.

The instrument consists of a cylinder and piston with a cylinder attached to the frame and the piston rod attached to the axle by flexible rubber mountings. Control is obtained by simple ball check valves, one in the piston rod and one in the lower cylinder housing.

There are no springs, the device requires no lubrication and when the adjustment is once made it is claimed to be permanent.

Col. Egge is Air Referee

NEW YORK, Aug. 13—Colonel C. F. Egge, of Cleveland, has been appointed referee for the 1929 national air races to be conducted in that city Aug. 24 to Sept. 2. The appointment was made by the National Aeronautical Association. Colonel Egge has been associated with aviation since 1918, having served in a supervisory capacity with the air mail service.

Autocar Interest Sold By Founders

32-Year Control Passes From
Clarke Brothers to
Syndicate

PHILADELPHIA, Aug. 14—Louis S. and John S. Clarke, founders of the Autocar Co. of Ardmore, Pa., and holders of virtually a controlling interest in the common stock of the organization since its inception in 1897, announced yesterday the sale of their holdings in the Autocar Co. to a group of banking houses which includes Prince and Whitely, Janney & Co., and Battles & Co. Thus for the first time since it began operations in Pittsburgh, back in 1897, a controlling interest in the stock of the corporation passes out of the hands of the Clarke family.

In making the announcement of the transfer of holdings, John S. Clarke said: "My brother and I have passed control of the Autocar Co. into the hands of men whose financial stability and operating abilities cannot fail to push the company forward in the future as it has progressed in the past."

"This change in control takes place at a time when the company has just passed through two of its most successful years and when the outlook for the future gives every promise of soundness. With the large investment the bankers will have in the Autocar Co. by the purchase of our stock and the purchase of additional stock from the Company's treasury, we feel that the resumption of dividends can be expected reasonably soon."

The Autocar Co. was founded by Louis S. and John S. Clarke in Pittsburgh in 1897. Building was begun on the Ardmore plant in 1900. Although a commercial car was built as early as 1899, chief attention was given to passenger cars until 1907. Since then only motor trucks and buses have been produced.

Louis S. Clarke was the technical genius of the organization throughout its early years and was responsible for first shaft drive automobile ever built in the United States. He was responsible also for many other technical developments in the automotive field.

John S. Clarke has served as vice-president of the Autocar Co. for twenty years, has served continuously as a member of the board of directors since

his connection with the organization and has been active as a member of the motor truck committee of the National Automobile Chamber of Commerce.

Autocar Earns \$11.05 Per Share

ARDMORE, Aug. 13—The Autocar Co. earned \$11.05 for each outstanding share of common stock during the first six months of the current year, according to the financial statement and report issued by President R. P. Page, Jr. here today.

Mr. Page's statement indicates that the earnings for the corresponding period of 1928 were \$3.04 per share. The net for the entire year 1928 amounted to \$10.10 per share of common stock, the company has earned more for the common stockholders during the first half of the current year than during the entire twelve months of 1928.

Sales of Autocar trucks for the first six months of the current year showed an increase of 40 per cent over the same period in 1928. This increase in sales is a direct response to the entire new line of both 4 and 6-cylinder trucks which the company introduced early this year. As knowledge of the Autocar Company's remarkable sales and earnings volume has become suddenly more general there have developed various conjectures regarding possible mergers involving this company. For that reason President Page added to his statement today that the Autocar Company "is not negotiating nor contemplating a merger with any other company."

Columbia Axle Co. is Bought by Cord Corp.

CLEVELAND, Aug. 15—Affiliation of the Columbia Axle Co. with the Cord Corp. was announced today by E. H. Parkhurst, president of the Columbia Axle Co. Mr. Parkhurst announced that the Cord Corp. had purchased a 50 per cent interest in the company, with the possibility that this would be increased later.

"This transaction is particularly advantageous to the Columbia Axle Co.," Mr. Parkhurst stated. "It gains \$1,000,000 in additional working capital with which to provide for a rapidly increasing volume of business and receives the benefit of the management that has been responsible for the growth of the Auburn Automobile Co. The present officials of the company, of course, will continue to actively direct the business."

The Columbia Axle Co. has for many years been one of the leading manufacturers of front and rear axles for the automotive trade and has one of the largest plants in Cleveland. The Cord Corp. was recently formed by the Auburn automobile interests as a management holding company, with indicated capital of \$125,000,000.

It was announced by Mr. Parkhurst that to give effect to the entrance of the new interests, E. L. Cord would become chairman of the board and L. B. Manning, R. S. Pruitt and Haydn Hodges,

all officials of Cord Corp., are added to the directorate. Mr. Parkhurst, formerly vice-president and general manager, was elected president and general manager at a meeting Tuesday, Aug. 13. R. E. Fries and F. H. Ragan were named vice-presidents and directors.

Cord Corp. on Exchange; Assets Are \$28,551,635

CHICAGO, Aug. 15—The capital structure of and investments held by the Cord Corp. were revealed last night when governors of the Chicago stock exchange announced approval of the listing of the company's shares. It was disclosed that the Cord Corp., recently formed by the officers and principal executives of the Auburn Automobile Co., and its affiliations, as of Aug. 1, had total assets of \$28,551,635, of which \$5,391,682 was in cash and subject only to accrued federal taxes of \$20,500.

The investments were listed at \$23,135,952, consisting principally of stocks in the Auburn Automobile Co., Lycoming Mfg. Co., Columbia Axle Co., Corman Aircraft Corp., Limousine Body Co., and Dusenbergh, Inc.

Outboard Motors Begins Additions to Factories

MILWAUKEE, Aug. 14—The Outboard Motors Corp. of Milwaukee, a recent consolidation of the Evinrude and Elto rowboat engine concerns at Milwaukee, and the Lockwood interests of Jackson, Mich., is preparing to effect a physical merger of the properties and is starting work on several additions to the Evinrude plant at Twenty-seventh St. and Capitol Drive. These embrace a one-story machine shop, 80 x 225 ft.; a testing room, 64 ft. sq.; two-story office addition, 80 x 90 ft., and an auxiliary building, 15 x 80 ft.

Mather Plant Begun

TOLEDO, Aug. 12—Work has started on the new bumper plant of the Mather Spring Co. The general contract for the structure, 700 ft. long by 90 ft. wide, was awarded to the H. J. Spieker Co., and is to cost about \$500,000. It is located on the Dixie Highway about a mile north of the present spring plant.

English Student Seeks Record

LONDON, Aug. 9—J. H. Handley, a young Oxford undergraduate, is sailing this week-end with a four-and-a-half liter Bentley automobile to attempt to break the transcontinental auto record from New York to San Francisco. He will be accompanied across the Lincoln Highway by the Oxford oarsman R. H. Dutton.

Oakite Will Display Cleaners

NEW YORK, Aug. 14—Recently developed methods for automotive equipment cleaning will be educationally presented by Oakite Products, Inc., at the American Railway Association exhibit which opens at Atlantic City, Sept. 28.

Recession in Steel Demand to Continue

Production is Generally Heavy in Off-Month, Producers Statement Shows

NEW YORK, Aug. 15—The leading steel producer's unfilled tonnage statement, as of July 31, showing a decrease of 168,733 tons from June 30 and the smallest backlog, i. e., 4,008,177 tons, since the beginning of the year, is indicative of a moderate recession in steel demand generally and of heavy production in one of the year's off-months in rate of output.

Taking steel consumers of all classes as a whole, a further moderate recession in demand is looked for this month.

Steel demand from automotive consumers has frequently been known to be impressively active when that from other steel-consuming industries was decidedly disappointing. Just now, the fact that a very few small mills that are known to cater almost exclusively to the automotive industries are not so well situated in the matter of orders as some of the large producers is given much prominence as indicating curtailment in automotive takings of steel.

Aluminum—The market is marking time. Prices are unchanged. Demand for remelt metal, however, is on the uptrend, as evidenced by greater interest on the part of remelters in offerings of secondary metal. Following a shutdown of a week, one of the leading aluminum piston makers has gone on a double-shift basis of operations.

Copper—Much emphasis is being laid in copper market comments on the changed order of things in that fully 80 per cent of the copper consumption in the United States comes now from the fabricating subsidiaries of the leading copper producers which is only another way of saying that the copper producers who a few years ago marketed their output in the form of electrolytic ingots, wire bars, etc., now market four-fifths of it in the form of rolled, drawn and otherwise highly finished products. Prices remain unaltered. The Ss. Etruscan, from England, is reported to have 1000 tons of "standard" copper on board, this "carrying of coals to Newcastle" being interpreted in London as a stage device for its effect on the market.

Olds Improves Crankshafts

DETROIT, Aug. 14—Although no announcement of the fact has been previously made, the Oldsmobile six is now coming through with a counter-balanced crankshaft for smoother engine operation, in line with a policy of incorporating improvements in cars as the occasion warrants.

Moto-Meter Will Install Ice Indicators

NEW YORK, Aug. 13—The Moto-Meter Gauge & Equipment Corp. has received orders from the Western Air Express for 24 ice-warning indicators to be used on the tri-motored planes owned by the Western company in its passenger and express service.

Engineers Named as Delegates to Tokio

Americans Will Attend World Congress This Fall

NEW YORK, Aug. 14—The official delegates of scientific and technical societies and engineering educational institutions among the 250 Americans who will attend the World Engineering Congress in Tokio in the fall were announced yesterday. The Japanese authorities had asked that the official delegates be limited to about sixty.

The American committee of the congress, of which President Hoover is honorary chairman, and Dr. Elmer A. Sperry is chairman, will sail with the other delegates from San Francisco on two specially chartered ships on Oct. 10. The vessels to be used are the President Jackson and the Korea Maru.

Among the organizations represented by the delegates are the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers, the American Society of Electrical Engineers and the American Society of Civil Engineers, known as the four "founder" societies. Also among the delegates will be men chosen by special organizations, so that their number will cover virtually the whole range of engineering and technology in the United States, according to the announcement.

The following have been chosen as the official delegates to the congress:

Magnus W. Alexander	F. C. Martin
Dr. H. Foster Bain	Charles D. Marx
Dr. George D. Barron	W. B. Mayo
Edward Bartow	C. W. Merrill
F. W. Bradley	O. C. Merrill
Dr. George K. Burgess	Ralph Modjeski
Howard E. Coffin	L. A. Osborne
W. H. Carrier	H. deB. Parsons
George S. Davison	Asa E. Phillips
John V. N. Dorr	Donald B. Prentice
Byron E. Eldred	Antonin Raymond
John R. Freeman	Henry G. Reist
E. H. Fritch	Mark L. Requa
George W. Fuller	J. V. W. Reyniers
Mrs. L. M. Gilberth	Calvin W. Rice
C. E. Grunsky	Robert H. Richards
Allen Hazen	Joseph W. Roe
H. D. Hibbard	David Rushmore
Maurice Holland	Herman Schneider
John C. Hoyt	R. F. Schuchardt
F. L. Hutchinson	C. E. Skinner
James E. Ives	George Otis Smith
D. C. Jackson	Elmer A. Sperry
F. B. Jewett	Francis Lee Stuart
Maj. Gen. Edgar	A. N. Talbot
Jadwin	Max Toltz
C. M. Keys	E. N. Trump
C. W. Latimer	Daniel L. Turner
C. K. Leith	H. Bruce Walker
Wilfred Lewis	W. Y. Westervelt
Paul M. Lincoln	F. C. Harker
Francis F. Lucas	Charles W. Stone
Charles T. Main	William Elmer
E. R. Martel	

Parks Aircraft Orders 500 Panels

NEW YORK, Aug. 7—Consolidated Instrument Co. of America, Inc., has received an order from the Parks Aircraft Co. of East St. Louis, Mo., for special custom-built instrument panels to equip 500 planes. It has also received an order from the Cardinal Aircraft Co., a division of the St. Louis Car Co., for complete aircraft instrument pane's to be installed on 100 two-

place monoplanes on which the company is now in production. These two orders amount to over \$61,000.

European Engineers Adopt Standards for Automobiles

PARIS, Aug. 12—A first International Automobile Standards Congress was held here June 24 to 27. The automobile industries of Austria, Belgium, Czechoslovakia, France, Italy and Germany were represented by delegates. This congress was the result of a preliminary meeting held in Rome in February last, on the occasion of the international automobile congress there. At that time an agreement in principle was reached on the basis of German proposals regarding parts which were considered ripe for international standardization.

At the Paris congress, continental standards concerning shock absorbers, spark plugs, speedometer drives and control positions were definitely adopted. It is understood that some of these at least are S. A. E. standards converted to metric units, and where this applies, the standards are valid in the United States and in Great Britain also. In most cases the tolerances on the dimensions of the parts were also included in the international standard, which is considered of importance from the standpoint of interchangeability. A resolution was adopted at the congress which forbids the membership making alterations in the various standards for national purposes.

The next meeting of the International Committee on Automobile Standards will be held next fall.

Test Continental Air Engine

DETROIT, Aug. 14—The initial long distance trial flight with Continental Motors Corp.'s new seven-cylinder 160 horsepower radial engine was successfully accomplished this week. The new aircraft power plant was mounted on a Stinson four-passenger Junior cabin plane. The test work included 100 hours in the air before any attempt was made to leave the vicinity of the Stinson field, where all experimental work was handled. The plane was flown to Muskegon and back and later was flown to Manitou Island, a distance of 720 miles.

Ford Buys Old Plant

DETROIT, Aug. 12—Henry Ford has purchased the William MacDonald's Sons Steam Engines Works, Lapeer, Mich., for removal to his museum of early American history at Dearborn. The factory was established in 1863. Its founder, William MacDonald, Sr., died 26 years ago. The factory originally made steam engines and parts for lumber camps.

Jig Bushing Triples Spaces

PONTIAC, MICH., Aug. 14—The Jig Bushing Co. has tripled its floor space in its factory with a \$30,000 addition, adding about 10,000 sq. ft.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES.

NEW YORK, Aug. 15—The substantial increase in the prices of grain and some other agricultural products has enhanced the purchasing power in several sections of the country, and trade in those sections has been stimulated. The big industries have been operating at very satisfactory levels since the beginning of the month.

Sales of 36 leading store chains during July amounted to \$205,359,576, which marks an increase of \$47,657,090, or 30.21 per cent over those in the corresponding month last year. Sales of these same store chains during the first seven months of the year show an increase of 27.29 per cent over those a year ago.

R. G. DUN REPORT

Commercial failures during July, according to R. G. Dun & Company, numbered 1752, as against 1767 during June and 1723 a year ago.

CAR LOADINGS

Railway freight loadings for the week ended July 27 totaled 1,101,061 cars, which marks an increase of 66,735 cars over those a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Aug. 10, was 97.6, and compares with 98.6 the week before and 99.2 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Aug. 7 were 28 per cent above those in the corresponding week last year.

REDISCOUNT RATE

The Federal Reserve Bank of New York raised its rediscount rate on Aug. 8 from 5 to 6 per cent. On Aug. 9 the stock market suffered a severe collapse, with a decline in practically all shares. The decline was followed by partial recovery the following day, but most issues closed the week with pronounced net losses.

BROKERS' LOANS

Brokers' loans in New York City for the week ended Aug. 7 increased \$60,000,000, after successive increases the preceding eight weeks with only one exception. Total brokers' loans on Aug. 7 amounted to \$6,020,000,000, a new high for all time.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Aug. 7 showed a decrease of \$11,600,000 in holdings of discounted bills. There were increases of \$4,600,000 in holdings of bills bought in the open market and of \$10,300,000 in holdings of Government securities. The reserve ratio on Aug. 7 was 74.6 per cent, as against 74.4 per cent a week earlier.

Duty Shift Came as View Changed

WASHINGTON, Aug. 10—Members of the Senate Finance Committee have fixed the duty on automobiles at 10 per cent and eliminated the countervailing duty provisions of the present law, in accordance with the change of view indicated by Alvin Macauley, president of the National Automobile Chamber of Commerce and of the Packard Motor Car Co.

The fight, led by Republicans on the committee for a lower rate of duty in the Hawley-Smoot bill, was won after the committee had already proposed a 25 per cent duty and the inclusion of the countervailing duty provided in the Fordney-McCumber act, which program had been previously approved by automobile manufacturers at a hearing held here recently.

It was learned that Mr. Macauley reversed his views after having opposed the lowering of the tariff as well as the repealing of the countervailing duty provision. The present 25 per cent rate will be retained on more expensive trucks and on buses of a capacity of 10 or more persons. Vehicles of this character, it was pointed out, cannot be made in mass production.

Although the Finance Committee has

made considerable headway with the tariff bill, it is not likely that it will have the measure ready for the consideration of the Senate when that body reconvenes on Aug. 19.

Imports of automobiles, trucks and buses are so few as compared to exports that the retention of any duty whatever is rather a precautionary measure than one for revenue purposes.

Michiana Products Corp. Merges Two Companies

MICHIGAN CITY, IND., Aug. 12—The Michiana Products Corp., recently organized, announces that it has taken over the properties of the Chrobaltic Tool Co., and the Sheet Steel Products Co., both of this city, and will continue the business and enlarge the facilities of both concerns.

The Chrobaltic division will continue to manufacture heat and acid resisting alloy castings and the sheet steel products division will continue to manufacture and service the Hall-Winslow line of oil filters and air cleaners for engines as well as pressed metal parts.

Hupmobile Cabriolet is \$1,075

The price of the four-passenger Hupmobile cabriolet was given in error as \$1,070 in *Automotive Industries* last week. The price of this model is \$1,075.

Finds New Source of Ethyl Alcohol

WASHINGTON, Aug. 14—Conversion of ethylene gas from blast furnaces, oilcracking processes and other industrial sources, offers a new and unlimited non-agricultural source of supply for grain alcohol, according to Dr. James N. Doran, Commissioner of Prohibition.

In a letter to Senator Watson of Indiana, the Commissioner explained that a permit had been granted to the plant of the Carbide and Carbon Chemical Corp., South Charleston, W. Va., a subsidiary of Union Carbide Co., for experimental production of synthetic alcohol on a commercial scale.

"The basis of the production is the conversion of ethylene gas to ethyl alcohol and the subsequent purification of the ethyl alcohol. There are a number of sources of ethylene, of which petroleum and gases from coke ovens are the most important.

"Under this temporary permit, the company produced approximately 48,000 proof gallons of ethyl alcohol, synthetic, which was denatured and used in the regular chemical process of the company.

"The manufacture of alcohol in this manner is only limited by the supply of petroleum and coal."

Opel Engineers and Factory Executives Visit Flint Manufacturer



Engineers and superintendents of the Opel Motor Works, near Berlin, who are in the United States to observe American manufacturing methods in the industry. Members of the delegation visited the AC Spark Plug Co. at Flint last week. Top row, left to right: Dr. Hans Navratil, petrologist, AC Spark Plug company; Johannes Schmitt, Carl Eberlein, A. B. Kronert, J. Fisch, Charles Voight (interpreter). Bottom row: F. Herbert, Eugen Dierolf, K. W. Schwarz, Taine G. McDougal, AC vice-president in charge of foreign plant; H. Leuders, General Motors Export representative of Berlin; J. Steckermeier and G. Vollrath

Men of the Industry and What They Are Doing

Peerless Names Karlson; Others Given Promotions

Edwin Karlson, J. T. Nicholson, L. H. Patterson and S. T. Creighton have been added to the executive roster of the Peerless Motor Car Corp., J. A. Bohannon, president, announced. Mr. Karlson, for more than 20 years a recognized figure in the automobile world, was appointed vice-president in charge of all manufacturing. Born in Stockholm, Sweden, he obtained valuable practical experience with L. M. Erickson & Co., one of the leading manufacturing firms of Europe. He joined the Lozier Automobile Co. when he came to the United States and the Chandler Motor Car Co. secured his services as general foreman in 1913. Soon he was promoted to works manager of the Cleveland division of the company. He came to Peerless from Marmon Motor Car Co., where he was general works manager.

Mr. Nicholson, connected with Cleveland automobile concerns for 14 years, is now service manager. Mr. Patterson is secretary-treasurer and Mr. Creighton, former factory controller of an Indianapolis manufacturer, is purchasing agent.

Woods to Make Accessories

"Dick" S. Woods has resigned as chief engineer of the Craveroller Co. of America and announces that he is forming a company to manufacture a line of motor car specialties. Among these specialties will be a combustion region oiler of entirely new principle. This oiler will be made in a variety of types for different classes of engines including marine and rail car power plants. In addition the new company plans to make a "combustion region" oil, a "run-in," a fuel pump as well as other items.

McCracken Returns

William McCracken, assistant secretary of commerce, who has been abroad making a survey of aviation conditions in Europe, has returned.

Turkish Aircraft Delegation is Here

Major Shefik Bey, heads a Turkish delegation which has just arrived in New York. They will visit aircraft factories in this country.

Capt. Goodman-Crouch Arrives

Captain R. J. Goodman-Crouch, English aircraft designer, recently elected vice-president of the Whittlesey Mfg. Co. of Bridgeport, Conn., has arrived in New York.

Herron is Air Investors' Official

W. G. Herron, Chicago, formerly vice-president of Boeing Air Transport, Inc., has been elected vice-president of



Edwin Karlson

formerly works manager of Marmon Motor Car Co., who has been appointed vice-president in charge of manufacturing for Peerless Motor Car Corp., Cleveland

Air Investors, Inc. Mr. Herron, while connected with the former had charge of the development of the Chicago and San Francisco air mail route.

Soper is Vice-President of La France-Republic

F. D. Soper has been appointed vice-president of the LaFrance-Republic Sales Corp., and general manager in charge of the operations at the Alma, Mich., plant. He has assumed his new duties and has established his residence there.

Coughlin Donates Campanile

As a mark of respect to his alma mater, Charles L. Coughlin, vice-president, treasurer, and general manager of the Briggs & Stratton Corp., and president of the Evinrude Motor Co., Milwaukee, has presented South Dakota State College, at Brookings, a beautiful campanile, to be completed this fall.

Cardway is Atterbury Sales Head

Colonel Fred Cardway of New York has been appointed vice-president in charge of export sales for Atterbury Motor Car Co., which has designed five new types of trucks for distribution throughout the world.

Seeley Joins Overseas Motor

R. W. Seeley, formerly general manager for Dodge & Seymour, Ltd., for India, Burma and Ceylon, has joined the sales staff of the Overseas Motor Service Corp., New York.

General Motors Truck Corp. Makes Promotions

Several changes in the executive offices of the General Motors Truck Corp., effective immediately, are announced by Paul W. Seiler, president. I. B. Babcock is promoted from vice-president and treasurer to executive president. M. T. Boden, formerly vice-president and office manager, takes Mr. Babcock's old position. He will be in charge of the financial setup for the entire corporation.

Frank V. Hadas, who has been an executive with the Ford Motor Co. for a number of years, is named vice-president and assistant general manager, to fill the vacancy created by the resignation of Louis Ruthenburg. E. R. Breech, formerly comptroller, has taken a position as general assistant treasurer of the General Motors Corp. in New York. He is succeeded here by D. L. Tate, who was head of the accounting department. In his new post he is in charge of all internal accounting at the Pontiac general truck plants and also of the subsidiary companies. R. C. Siple is taking up new duties as branch auditor. He will be assisted by George Beh. These men will be in charge of all branch auditing.

Bagnor Visits Mexico

J. J. Bagnor, assistant to the export manager of Durant Motors, is in Mexico City. During his trip through Mexico he expects to visit every Durant distributor and prominent dealer in the country, and on his return he will visit dealers in Cuba. H. G. Gilpin, Durant export manager, is on his way back from South America where he has made similar calls on South American distributors.

Alloys' Executives Fly to Milwaukee

H. H. Harris, president of the General Alloys Co., Boston, accompanied by Dalles M. Speer, assistant sales manager, both wartime air pilots, recently made a trip to Milwaukee in their own ship from Boston to confer with executives of the Milwaukee plants of the Nash Motor Co. and the International Harvester Co.

Divco Promotes K. R. Herman

K. R. Herman has been promoted from assistant to chief engineer of the Divco-Detroit Corp., according to an announcement of John Nicol, vice-president and general manager.

Grossman Leaves to Study Steels

M. A. Grossman, chief metallurgist of the Central Alloy Steel Corp., Canton, has sailed for his third trip abroad this year to study special European steels.

Holds World Peace Follows Business

G. M. C. Executive Tells Advertisers That Good Will Wins

BERLIN, Aug. 15—It is time for the various nations of the world to stop making faces at each other, according to James D. Mooney, vice-president of General Motors Corp. and president of General Motors Export division, in an address before the International Advertising Convention here.

"We do not question the right of any nation to defend itself for war, or to defend its industries, but we do maintain that the various nations can get together on some common ground of good will.

"The general speeding up of transportation and intercommunication of ideas has actually made neighbors of the most distant countries. These are some of the instruments available for the promotion of international trade that can, in turn, solve many of the economic and political problems of the world," he said.

He pointed out that advertising men had done much to "sell" the war peoples of the world on neighborliness and that in the scheme of international distribution, which he believes will bring about peace, they have played an important part.

"There is no more reason why we economists should accept the inevitability of our present economic ills and misery, than for the scientist to accept the inevitability of smallpox, yellow fever or the bubonic plague," he said.

"The printed word is lifting the world out of its economic morass. We are experiencing the beginnings of an economic renaissance," he said.

Biltmore and Ero Merge Manufacturing Facilities

CINCINNATI, Aug. 7—Stockholders of the Biltmore Mfg. Co. ratified the merger of the company with the Ero Mfg. Co., of Chicago. The combined company will be known as the Biltmore Ero Mfg. Co., with main offices at Chicago. Howard Leopold is president and A. W. Connor is vice-president in charge of sales and advertising.

The sales volume of the new concern, officers estimate, for the current year will aggregate close to \$3,000,000. The company will continue to operate its factories in Cincinnati, Chicago, Los Angeles and Philadelphia and additional branch factories are to be opened at distributing points throughout the United States.

Bendix Incorporates Subsidiary

CHICAGO, Aug. 12—The Bendix Aviation Corp. announces the incorporation of the East Orange, N. J., plant of the Eclipse Machine Co. as a subsidiary unit to be known as the Eclipse

Graham-Paige Motors Corp. and subsidiaries report net profit for the six months ended June 30 of \$1,341,711 after all charges. Consolidated balance sheet as of June 30 shows current assets of \$21,858,877 as against current liabilities of \$7,058,855.

Mack Trucks, Inc., reports net profit for the first six months of the current year of \$3,911,128 after all charges, or the equivalent of \$5.17 a share, as compared with \$2,830,055, or \$3.84 a share, for the corresponding half of 1928. Earnings for the second quarter were \$2,481,541, or \$3.28 a share, as compared with \$2,084,383, or \$2.83 a share, for the corresponding quarter a year ago.

United Aircraft and Transport Corp. reports net profit for the six months ended June 30 of \$4,410,045, or \$2.55 a share, on outstanding stock. Earnings for the June quarter were \$2,606,034, or \$1.52 a share, after preferred dividends. Unfilled orders of the equipment company at the end of June amounted to more than \$13,000,000. These figures do not include earnings of Sikorsky Aviation Corp. or the Stearman Aircraft Co., which recently joined the group. Rumors current in Wall Street to the effect that United Aircraft was negotiating for the purchase of Standard Steel Propeller Co. of West Holmstead, Pa., received no comment in the office of United.

Outboard Motors Corp. reports for the quarter ended on June 30 gross sales of \$2,074,661 and net profits of \$323,567. This is the first quarter of operation for the new corporation which brought the old Elto, Evinrude and Lockwood Outboard motor companies together.

Allied Motor Industries declared an initial quarterly dividend of 25 cents in cash and 1 per cent in stock on common.

Link Belt Co. for the six months ended on June 30 reports a surplus of \$1,385,932 after Federal taxes and preferred dividend requirements, equal to \$1.95 on 709,177 no par shares of common stock.

Stinson Aircraft Corp. reports gross sales for the seven months ended July 31 of \$814,917, which compares with \$675,249 for the corresponding period of 1928.

Kelsey-Hayes Wheel Corp. and subsidiaries report net profit for the six months ended June 30 as \$1,975,779 after all charges, equivalent after preferred dividends to \$2.43 a share. This compares with

\$477,066, or \$1.02 a share, for the corresponding period of 1928.

Curtiss Aeroplane & Motor Co. reports a consolidated net income for the June quarter of \$692,505 after interest, taxes and other charges equal to \$1.98 a share on 348,896 shares outstanding, as against \$386,237, or \$1.11 a share, in the preceding quarter and \$752,310, or \$2.58 on 290,747 shares, in the June quarter in 1928. The net profit for the six months ended June 30 was \$1,078,743, or \$3.09 a share, as against \$942,432, or \$3.24 a share, in the 1928 period.

Briggs Mfg. Co., for the June quarter, reports a net profit of \$1,018,130 after depreciation, Federal taxes and other charges, equal to 51 cents on 2,003,225 shares of no par stock, as against \$1,404,567, or 70 cents a share, in the preceding quarter and \$1,356,125, or 67 cents, in the same quarter last year. For the six months ended June 30, profits totaled \$2,422,697 after the above charges, equal to \$1.21 a share, as against \$2,053,553, or \$1.02 a share, in the first half of 1928.

Peerless Motor Car Corp. and subsidiaries report for the June quarter a net loss of \$184,949 after interest and depreciation, against a profit before Federal taxes of \$23,833 in the preceding quarter and a loss of \$403,994 in the June quarter of 1928. Net loss for the six months ended June 30 totaled \$161,116, against a net loss of \$597,528 in the same period of 1928.

Melling Forge Co., Lansing, Mich., shows a net profit of \$97,610, after taxes, for the six months ending June 30, according to a survey recently completed by Otis & Co., financial house. This is equivalent to \$5.75 a share for the period, or at a rate of \$11.50 per year. It is anticipated that the Melling stock will be listed on the Detroit Stock Exchange soon.

Aluminum Industries, Inc., showed earnings for the first six months of 1929 of \$175,113, equal to \$1.75 a share on the company's stock. The semi-annual statement shows current assets as of June 30, 1929, of \$1,073,625 and current liabilities of \$163,124. Earnings equalling \$1.75 a share for the first six months this year compare with earnings of \$1.90 a share over the entire year of 1928. Payment of the quarterly dividend of 37½ cents a share, payable Sept. 16, to stock of record Aug. 31, was authorized.

Aviation Corp. The plant has developed and is producing a complete line of starters for aircraft, engine driven generators both for battery charging and radio, and other aircraft equipment.

Germany Regaining Lead

WASHINGTON, Aug. 15—Germany is regaining her lost position in the automotive exporting field, according to a cable received by the Department of Commerce this week from Douglas Miller, assistant commercial attache at Berlin. Automotive exports from Germany last year showed an increase of 71 per cent over the previous year, the

report states. Before the war Germany ranked next to the United States and France in automotive exports. It is now in sixth place, being exceeded by the United States, France, Great Britain, Canada and Italy, and figures seem to indicate that it is gradually bidding for its pre-war position.

Aniline Builds Addition

RENSSELAER, N. Y., Aug. 14—Construction has been begun on a three-story reinforced concrete addition, 100 by 102 ft., to the plant of the General Aniline Works at Rensselaer. The completion of the new plant is scheduled for Nov. 1.

Australians Making Fuel From Molasses

New Distilling Method is Used to Make Alcohol

LONDON, Aug. 14—Production of fuel alcohol manufactured from molasses has become a successful enterprise in Australia. Two additional distilleries will supplement Australian National Power Alcohol Co., Ltd., at Sarnia, Mackay district.

The new motor fuel, known as "shellkol," is being distributed throughout the neighboring territory. The capacity of the plant is 750,000 gal. a year, according to A. Yvian Board, technical director of the company. "Until recently," he said, "it has not been possible to distill alcohol to a greater strength than 95 per cent and this factor limited the technologist in the creation of suitable fuel for burning in ordinary motor engines as at present designed.

"The anhydrous alcohol, which is being produced, will mix with petrol in any proportion. It is now definitely possible to improve the quality of petrols as they exist today by blending them with alcohol of absolute strength, something which it has not been possible, until recently, to do.

"We hope eventually to make use of the entire surplus molasses of Queensland for which there has not been any use until this discovery was made. If the future warrants it, it is possible that our company will produce power alcohol in other states.

"The molasses is not the only raw material out of which power alcohol can be made," he adds. "Cultivated crops of different kinds yield power alcohol in payable quantities, but it is probable that in the future the extension of industrial alcohol lies with waste cellulosic material."

One of the advantages claimed for the new fuel in which the power alcohol is incorporated is that it is definitely anti-knock, which means that it will stand higher compression with consequent greater efficiency. It is maintained that the new fuel will give smoother running of the engine with marked additional pulling power, especially on hills.

Geneva Foundry to Build

GENEVA, N. Y., Aug. 14—The Geneva Foundry Corp., maker of small automobile castings, has acquired land adjoining its plant here, upon which it is planned to erect a large addition and install new machinery and equipment.

Bailey Seeking Decatur Site

DECATUR, ILL., Aug. 14—The Bailey Auto Body Co., St. Louis, has been negotiating for a building for a district office and assembling plant here, it was reported.

Speed Limit Should Go, Says British Royal Commission Transport Report

LONDON, Aug. 10—The first report of a Royal Commission on transport appointed by the late Government in England commences with a recommendation that no speed limits should apply to passenger cars and motor cycles, that motor buses and coaches should be allowed to run up to 35 or 40 m.p.h. when fitted with pneumatic tires and that trucks with the latter, and weighing less than 2½ long tons unladen, should have a legal maximum speed of 30 m.p.h.

In place of speed limits in the case of cars and to discourage dangerous driving of all classes of vehicles it is suggested that the existing penalties for endangering the public should be greatly increased; a maximum fine of £50 for the first offense is specified and £100 for the second or subsequent offense, with imprisonment an alternative in either case, in addition to the automatic suspension of the driver's license for not less than six months on the second or subsequent conviction, irrespective of whether a fine or imprisonment be imposed.

The commission points out that the existing code of motor laws in Great Britain is obsolete; not one motorist in a thousand observes the general speed limit of 20 m.p.h. and in many parts of the country there is no attempt to enforce it, and yet it may be and occasionally is capriciously enforced. It urges that fresh legislation should be enacted without delay and that the Minister of Transport should be empowered to order an inquiry into the cause of any motor accident, recommending that such inquiry should be obligatory when the accident is to a public service vehicle involving the death of a passenger.

The report expresses the view that dangerous walking is almost as productive of fatal accidents as dangerous driving, but while no penalties for "jay walking" are suggested nor any new laws for the regulation of pedestrian traffic, it is urged that road authorities should be bound to provide footpaths at the side of all roads and that they should be maintained in as good a condition as the roadways. Education and propaganda are recommended, and it is suggested that the National Safety First Association should receive official recognition and support.

Tests of driving proficiency as a prelude to the issue of driving licenses are not recommended, but it is proposed that a declaration of physical fitness should be made by applicants for driving licenses and a severe penalty imposed for a false declaration. It is held that a license to drive a motor cycle should not be granted to anyone under the age of 16 years (the present minimum is 14) and that no one under 21 should be allowed to drive a truck which exceeds 2½ tons in unladen weight or any kind of public service vehicle.

Among other recommendations it is suggested that at road junctions traffic on the less important road should give way to that on the more important, and that on the less important roads conspicuous notice boards should be erected with some such words of warning as "Dead Slow." It is added, however, that this does not imply that main road traffic should have the absolute right-of-way nor that drivers on main roads should be absolved from responsibility for their share of the avoidance of accidents at such points, the report recommends.

New Aviation Map Shows Airports in 216 Cities

NEW YORK, Aug. 12—A new aviation map of the United States, compiled by the Aeronautical Chamber of Commerce of America, reveals that 216 cities have established themselves on the "air map" as aircraft manufacturing or operation centers. Planes fly 80,000 miles daily with passengers, mail and express between these cities, which are linked by 30,000 miles of established airways, according to the organization. Mail planes fly 50,000 miles daily across 41 of the 48 states, northward into Canada and south into Mexico, Central and South America.

The establishment of transcontinental air-rail service by several transport operators during the last two months proved the biggest single factor in increasing the passenger mileage flown daily. Planes carrying passengers on scheduled routes now are flying approximately 30,000 miles daily, exclusive of the 50,000 miles flown every

24 hours by mail planes. While the chamber estimates that there is some aeronautical activity in more than 300 cities and towns, most of it is concentrated in the 216 communities where members of the aircraft trade association are located.

Nash Announces Lower Prices "To Clear Decks"

KENOSHA, WIS., Aug. 13—The Nash Motors Co. has announced new prices, effective Aug. 12, on the following advanced six models:

7-Passenger Limousine	\$1865
7-Passenger Sedan	1790
Ambassador 4-Door Sedan	1725
4-Passenger Coupe	1595
4-Passenger Cabriolet	1495
2-Door Sedan	1430
4-Door Sedan	1450
Special Six, 7-Passenger Sedan	1445
4-Passenger Roadster	1225

These reductions, according to company officials, are made "to clear the manufacturing decks" for the introduction of new 1930 models later.

General Motors Acceptance Shows Total Assets of \$483,216,245

NEW YORK, Aug. 13—General Motors Acceptance Corp., in its consolidated balance sheet as of June 30, shows a total of notes and bills receivable of \$414,662,474. Other accounts receivable are listed at \$1,508,244. Total assets are given at \$483,216,245. The complete statement follows:

ASSETS		
Cash in banks and on hand		\$55,766,642.12
Notes and bills receivable:		
United States and Canada	\$353,799,461.57	
Overseas	60,863,012.68	
		414,662,474.25
Accounts receivable:		
Affiliated corporations	9,316.71	
Other	1,498,927.99	
		1,508,244.70
Furniture and equipment, less depreciation		1,393,788.08
Investments:		
General Exchange Insurance Corp.	5,222,703.77	
Other	6,000.00	
		5,228,703.77
Deferred charges:		
Unamortized debt discount and expense	2,191,531.74	
Prepaid discount	2,449,243.29	
Other	15,616.84	
		4,656,391.87
TOTAL ASSETS		\$483,216,244.79
LIABILITIES		
Capital stock	\$40,000,000.00	
Surplus	10,000,000.00	
Undivided profits	16,565,695.43	
		\$66,565,695.43
Ten year sinking fund 6% gold debentures:		
Due Feb. 1, 1937	50,000,000.00	
Retired through sinking fund	3,000,000.00	
		47,000,000.00
Five per cent serial gold notes:		
\$5,000,000 due annual March 1, 1930 to 1936		35,000,000.00
Notes and bills payable:		
Notes, United States	222,760,500.00	
Notes, Canadian and overseas	41,710,488.26	
Bankers' acceptances discounted	19,713,375.00	
Bills of exchange discounted	4,915,317.16	
		289,099,680.42
Accounts payable:		
Affiliated corporations	8,472,997.43	
Other	2,194,174.71	
		10,667,172.14
Accrued accounts:		
Interest payable	1,758,333.32	
Taxes—Federal income, etc.	1,883,569.25	
		3,641,902.57
Dealers' repossession loss reserve		7,764,339.80
Unearned income		16,422,119.17
Reserves:		
Receivables	5,937,025.66	
Contingencies	1,000,000.00	
Miscellaneous	118,309.60	
		7,055,335.26
TOTAL LIABILITIES		\$483,216,244.79

Ohioans Can Rent Planes

COLUMBUS, Aug. 14—The agency of the Saunders Drive-It-Yourself here says that Columbus will be among the first of the places to be supplied with airplanes on the same basis as automo-

biles. Planes will be rented to experienced pilots. The Saunders Fly-It-Yourself is now being organized in Kansas City, and 100 planes have been ordered from the Arrow Co., Lincoln, Neb.

Ford Attains New High Mark in Plane Building

DETROIT, Aug. 12—Production of Ford tri-motor all-metal monoplanes broke all existing records during the month of June. A total of 25 were trimmed and 18 were test-flown. The last named total is larger by at least six planes than any previous monthly production figures since the manufacture of airplanes was undertaken by the company.

Among the deliveries of June-built planes were those made to the U. S. Navy, U. S. Army, New York Rio & Buenos Aires Airways, Inc., Pan American-Grace Airways, S. A. F. E., Inc., Stout Air Service, Inc., Pitcairn Aviation, Inc., and Curtiss Flying Service, Inc.

Wisconsin Air Code Signed

MILWAUKEE, Aug. 14—Governor Kohler of Wisconsin has signed the bill enacting the state's first aviation code, which has gone into effect. The new law authorizes municipalities and counties to acquire sites for airports, to construct hangars and to provide other equipment for such airports; authorizing the making of municipal rules and regulations for landing fields and airports; prohibiting stunt flying over thickly inhabited areas or public gatherings, and providing that the owner of an aircraft is absolutely liable for all damages to persons and property caused by ascent, descent, or flight of the aircraft, or the dropping therefrom of any object, whether the owner was negligent or not, unless the injury is caused by the negligence of the person injured.

Ohio Employment is Slack

COLUMBUS, Aug. 14—The Bureau of Business Research of Ohio State University, in its bulletin covering a survey of employment in the automobile and automotive parts industries in Ohio, shows that July employment in these industries was 5 per cent less than that of June, but was 24 per cent greater than that of July, last year. During the first seven months of the year employment in the industries was 34 per cent greater than during the corresponding period in 1928.

In the tire and tube industries employment in July was slightly less than that of June, this year, but was 13 per cent greater than that of July, last year.

Lockheed on New Efficiency Basis

NEW YORK, Aug. 7—Lockheed Aircraft Co., recently acquired subsidiary of the Detroit Aircraft Corp., has increased its working schedule from 45 to 47 hours a week and through other economies has succeeded in reducing the working personnel, without in any way retarding production.

Packard Gains in New York

NEW YORK, Aug. 8—Packard Motor Car Co. of New York reports that sales in its territory during the first six days in August established a new record for any similar period.

Insurance Rates on Collisions Lowered

National Bureau Adjusts Schedule in Eastern Section of U. S.

NEW YORK, Aug. 13—Collision insurance rates have been reduced for the Eastern section of the country by the National Bureau of Casualty and Surety Underwriters. The reductions average 15 per cent on first-class policies, 13 per cent on second and 15 per cent on third for the so-called \$50 deductible, \$100 deductible and \$250 deductible policies.

There will be no change on full coverage policies. New policies will be issued for private cars in the form of \$25, \$35, \$75 and \$100 deductible.

A \$500 deductible form, hitherto available only for buses, will be extended to private cars and commercial automobiles.

These rates will apply in New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Delaware, Maine, Maryland, New Hampshire, Rhode Island, Vermont and the District of Columbia.

Rolls-Royce Co. Denies Reports of New Model

LONDON, Aug. 3 (*Special to Automotive Industries*)—An official statement issued by Rolls-Royce today states that particulars published this morning in an influential London newspaper concerning a new model to be introduced in the near future are unauthorized and quite inaccurate.

The report stated that an entirely new chassis was to be put on the market shortly, rated at 37 hp., and capable of 100 m.p.h. It was said, among other things, that the engine would have an overhead camshaft (an innovation for Rolls-Royce so far as automobile engines are concerned), that the chassis would have a "kick up" at both ends, giving a very low body height, that hydraulic suspension would be used and that the engine would develop 180 b.h.p.

Chrysler Buys Site

DETROIT, Aug. 12—The Chrysler Corp. has purchased a four-acre tract of land adjacent to its Jefferson Ave. plant. The purchase price of the land, which for 18 years has been the property of the F. M. Sibley Lumber Co., was not disclosed by Walter Darden & Co., investment realtors who handled the transaction. For tax purposes the property is said to be valued at "more than \$200,000."

Fageol Profits Increased

SAN FRANCISCO, Aug. 12—Fageol Motors of California reports for six months ended June 30, 1929, profit of \$182,578 after charges and depreciation, but before Federal taxes, comparing with \$149,436 in first half of 1928. Gross sales for the six months totaled \$2,285,887, against \$1,816,280.

General Motors' July Production Is Up 20,000 Units, Report Shows

NEW YORK, Aug. 16—General Motors manufacturing divisions produced during July 189,428 units or almost 20,000 more than in July of last year when production was 169,473 units.

Deliveries to consumers during the month totaled 181,851 as compared with 177,728 units for the corresponding month of last year and with 194,705 for June of this year. The gain in dealers' stocks during the month was thus 7577 units.

Total deliveries by dealers during the first seven months of the year were 1,262,905 as compared with 1,240,461 a year ago. Deliveries by manufacturing divisions to dealers were 1,361,296 as compared with 1,252,789 a year ago, showing an increase in dealers' stocks of 98,391 this year compared with 12,328 during the first seven months of last year.

This unusual increase in dealers' stocks is not regarded by the corporation officials as serious as is evidenced by A. P. Sloan, Jr.'s statement issued at the time the six months' earnings

were published. In this statement he called attention to the fact that dealers' stocks at the beginning of the year were abnormally low, due to the fact that there were a number of important model changes taking place at that time. As a result, much of this increase in dealers' stocks has been merely building these stocks back to normal. In addition the corporation has brought out during the period two new cars, the Viking and the Marquette and the necessary deliveries of these cars to dealers has broadened the range between deliveries to dealers and deliveries to customers.

Itemized deliveries month by month follow:

	Dealers		Divisions	
	Sales to Users	1928	Sales to Dealers	1928
Jan...	104,488	107,278	127,580	125,181
Feb...	138,570	132,029	175,148	169,232
Mar...	205,118	183,706	220,391	197,821
Apr...	223,303	209,367	227,718	197,597
May...	214,870	224,094	220,277	207,325
June...	194,705	206,259	200,754	186,160
July...	181,851	177,728	189,428	169,473
Tot.	1,262,905	1,240,461	1,361,296	1,252,789

Middle West Merging of Aero Interests Underway

DAYTON, OHIO, August 13—Further announcements are expected to be made in a few days regarding the proposed merger of a number of aero wholesale and manufacturing companies of the Middle West into a \$5,000,000 corporation, involving the Johnson Airplane Supply Co., located here.

According to newspaper stories appearing here last week, which E. A. Johnson, of the Dayton firm, would not deny, a group of capitalists, including Powell Crosley, Jr., radio manufacturer, of Cincinnati, and representatives of the Fleischmann interests, propose to merge the Metal Aircraft corporation, at Cincinnati, the Johnson Airplane Supply Co., and an unnamed firm of Wichita, Kan., together with other manufacturing and supply concerns in the airplane field, in a huge corporation.

North East Forms Belgian Company

ROCHESTER, Aug. 14—The North East Electric Co., has organized the Societe Anonyme Belge North East, at Antwerp, Belgium, to act as a parts depot. It will make shipments throughout Europe.

Ford Buys Old Brush

PAWTUCKET, R. I., Aug. 12—Henry Ford has bought a Brush automobile, more than twenty-five years old, from Henry Millette of Cumberland. Mr. Ford has asked Millette to ship the car, a single-cylinder chain-drive vehicle, to Dearborn, Mich.

Reports Progress on Mercer Plans

NEW YORK, Aug. 12—Harry M. Wahl, who heads a financial group in-

terested in the resumption of the production of the Mercer car, has stated that negotiations are under way with a large manufacturer in the Middle West to produce the 1930 line of Mercer cars.

Curtiss and Wright Show Biggest Half

NEW YORK, Aug. 13—The Curtiss Aeroplane & Motor Co. reports an increase in unfilled orders for the first six months of this year of more than 73 per cent over the same period last year. The unfilled orders this year are \$9,123,887, as compared with \$5,255,545 last year. The company reports additional orders under negotiation.

The Wright Aeronautical Corp.'s unfilled orders for this year are \$7,996,985, as compared with \$7,054,106 in the first half of last year. The combined gross business for both companies, whose consolidation will become effective tomorrow, for the first six months is \$12,414,689, an increase of more than \$3,716,000 over last year, and the combined unfilled orders to July 1 total \$17,120,872, an increase of more than 28 per cent over last year.

Holders of Curtiss-Wright certificates of deposit, received in exchange for stock of the Wright Aeronautical Corporation, will be entitled to receive the dividend recently declared on Wright company stock, payable on Sept. 15.

No Changes in Oakland and Pontiac

DETROIT, Aug. 14—W. R. Tracy, vice-president in charge of sales of the Oakland Motor Car Co., has announced that there will be no mid-summer changes in the Oakland and Pontiac cars.

Automotive Exports Break Every Record

First Half Shows Gain of
35 Per Cent Over
1928 Period

WASHINGTON, Aug. 15—American automotive exports during the first half of 1929 established a new high valuation record of \$354,874,924, exceeding those for the corresponding period of 1928 by \$92,200,361, or 35.1 per cent, according to an announcement this week by the automotive division of the Department of Commerce. This figure includes a number of items not shown in the table appearing in *Automotive Industries* recently, among which are parts, accessories for motor boats, electrical equipment, spark plugs and certain lighting equipment.

Shipments for the month of June totaled \$53,486,940 as compared with \$45,264,634 for May, and \$45,851,775 for June, 1928.

"To grasp the remarkable strides that have taken place in our sales of automotive products to markets overseas," says the Department's announcement, "it is only necessary to compare the value of such shipments during the first six months of this year with the January-June total for 1926 amounting to \$182,066,573. In the comparatively short period of four years we have witnessed an improvement of \$172,808,351, or 94.9 per cent." The monthly average for the first half of 1929 was \$59,145,485 as against \$43,779,094 in 1928; \$36,893,851 in 1927; and \$30,344,429 in 1926.

Notwithstanding the great increase in domestic production, export markets have demanded 10 per cent of the total output.

Passenger car shipments for the first half of the year show an increase of 25,256 in number and \$11,138,122 in value, while truck shipments are 43,834 or 74.4 per cent greater in number and \$20,277,896, or 49.6 per cent improved in value. Increased exports of passenger cars are accounted for by the slight gains in the low and medium-priced range. Shipments of the higher priced units were practically the same as in the first half of 1928. In the truck field the one-ton and one to two and one-half ton units have shown decided improvement with exports in the latter class more than double the total recorded during the first half of 1928.

Exports of "auto parts for assembly" registered a gain of \$43,764,172, or 147 per cent.

Canada's demand for American passenger cars placed this country far in the lead as our chief market in this classification with Argentina advanced to second position, replacing Australia which dropped to third place. The three leading truck markets—Argentina, Australia, and Brazil—remained unchanged, exports to each showing 100 per cent improvement over 1928.

Use Ash Trays While Flying—It's Safer

WASHINGTON, Aug. 15—Aviators employed by the United States Forest Service, flying from 500 to 1000 ft. above the ground, dropped several cigarettes and cigars from their planes while passing over forested areas.

Of six cigarettes and five cigars dropped, four cigarettes and all five cigars were burning when they reached the ground. Such butts, say forest officials, may cause forest fires.

It is recommended on the basis of these tests that measures be adopted to prevent the throwing of butts from planes.

Germany was the leading motorcycle purchaser.

For the month of June, Argentina replaced Canada as our leading market for passenger cars with a demand practically double that of the preceding month. Canada dropped to second position and Sweden rose from seventh to third place. The United Kingdom was the chief truck market during June with a gain of 3686 per cent in number of units required over May. Sweden, showing an increase of 892 per cent, was in second place. The unit passenger car and truck valuation for June was \$665 and \$601, respectively.

Morris Starts Big Scale Production of New Cars

WASHINGTON, Aug. 14—The Morris plant has started large scale production of a new car designed by Sir William Morris, which was first exhibited in London on July 9, for use in British colonies and other foreign countries, it was stated in a report received by the Commerce Department this week from its London representative.

The car, named the "Isis," is a full-sized five-seater salon which will sell for around \$1,400. It is equipped with a six-cylinder engine, developing 50 horse-power, an all-steel body, four-wheel hydraulic brakes, and safety glass. The problems of suspension and steering are designed especially for travel over rough colonial roads.

British Merger is Reported

WASHINGTON, Aug. 15—Negotiations for the merger of several leading British automobile manufacturers are reported to be well under way, according to a cable from London received by the Department of Commerce from its official representative this week. The names of the companies are not mentioned. The report states that automotive sales in the United Kingdom are improved because of favorable weather but the situation generally is affected by the uncertain outlook regarding tariffs and taxation.

Celebrate Millionth Sale of Chevrolets

Key Sales Chiefs, 2000
Strong, Meet in
Detroit

DETROIT, Aug. 17—To mark the sale of 1,000,000 Chevrolet six cars in less than eight months, Chevrolet Motor Co. played host to its entire sales supervisory force this week during a five-day convention here.

All regional and zone sales managers and their staffs and representatives in full force were in Detroit from Monday to Friday, during which business was combined with entertainment. When the last special train entered Detroit, the total number of visitors was close to 2000, the largest gathering of its sales chiefs in the company's history, it was announced.

The visitors were divided into the sales managers' group and the representatives' group. In the former classification were the nine regional sales managers, zone sales managers from each of the 52 zones, zone sales promotion managers, city sales managers, accounting managers, field assistant accounting managers, parts and service managers, used car managers, fleet managers and truck managers.

The representatives whose function it is to contact Chevrolet's 11,000 dealers were kept together through most of the convention in a single body. The big day was Wednesday, when both groups were consolidated for an all-day business program presided over by H. J. Klingler, vice-president and general sales manager.

The visitors were especially praised for their work in the last two and a half years since the last national convention, during which Chevrolet outsold every other automobile manufacturer. W. S. Knudsen, Chevrolet president, presided Wednesday evening at a banquet which included a huge assemblage of radio talent.

During this event the millionth Chevrolet, one of the recently announced Imperial sedans, was unveiled. Highlights of the convention included separate trips of the two groups to the Flint assembly plant which is one of Chevrolets 16 American plants and to the General Motors proving grounds.

Auto-Lite Earns \$11.42 a Share During First Half

TOLEDO, Aug. 12—Earnings of \$10,200,763 for the first half of 1929 were \$11.42 a share after all charges except Federal taxes, were reported by the Electric Auto-Lite Co., for its greatest half year in history. In the earnings is included \$4,000,000 profit from sale of a block of Bendix stock on April 12. Before this profit the earnings amounted to \$6.83 a share. In the same period in 1928 the company earned \$3.98 a share.

Air C. of C. to Hold Air Traffic Conference Soon

NEW YORK, Aug. 14—The Aeronautical Chamber of Commerce of America will hold an air traffic conference in Kansas City, Mo., Sept. 16 to 18, to enable air transport operators to exchange data on the solicitation and handling of air traffic. This will be the first time that traffic executives of all air transport companies have been brought together for a common discussion of traffic problems, including rates, consolidated ticket phases, baggage handling, advertising, publicity and allied subjects.

George M. Lord, Western Air Express, has been appointed chairman of the arrangements committee for this conference by Frederick B. Rentschler, president of the chamber. Other members are J. M. Eaton, traffic manager of Pan-American Airways Corp.; R. H. Ireland, traffic manager of National Air Transport, Inc.; W. A. Patterson, Boeing Air Transport, Inc.; F. B. Clement, Trans-Continental Air Transport, Inc.; W. T. Varney of the Varney Air Lines, Inc., and H. I. McNally, Universal Air Lines, Inc.

France Proposes to Keep Tax

PARIS, Aug. 12—Under the new French budget proposals for 1930, the state luxury tax will be reduced on all articles with the exception of automobiles. This tax is 12, 10 and 6 per cent, according to the nature of the goods. On automobiles it is 12 per cent. A strong campaign to have the automobile included in the reductions is being made by the French industry. It is pointed out that there are 1,200,000 automobiles in France at the present time, that the industry gives direct employment to 400,000 persons and that the direct and indirect state revenue from the automobile is \$94,826,416.

Tire Exports Show Increase for Half

WASHINGTON, Aug. 8—Exports of automotive rubber goods from the United States increased 19 per cent, from a value of \$20,813,300, during the first six months of 1928, to \$24,672,400 during the corresponding period of 1929, according to an announcement made this week by the Rubber Division of the Department of Commerce.

Plans Million-Dollar Plane

WASHINGTON, Aug. 14—Colonel Thomas L. Eggleston, president of the Eggleston Air Cell Airplane Co., has announced that he is going to build a million-dollar airplane that will carry 125 persons. He was a contemporary of the late Alexander Graham Bell, who encouraged him in his development of the plan he now proposes to make effective. "My plane," said Colonel Eggleston, "will have 12 cells and a wing span of 240 feet. The cars for passengers are to be 10 by 95 ft. and will be located in the center of the cell space. By stabilizers will have a width of 10 and a length of 90 ft. There will be eight engines of 800 horsepower each and eight 13-ft. propellers."

Wagner Electric Branch Moved

ST. LOUIS, Aug. 14—The Wagner Electric Corp. has moved its Cleveland service station and branch sales office to a new building at 3756 Carnegie Ave. The entire Wagner line of motors, transformers, fans and Lockheed hydraulic brakes are handled and serviced.

Sperry to Discuss Weld Tests at Cleveland Meet

NEW YORK, Aug. 14—Nine research papers will be presented at the coming meeting of the American Welding Society, Cleveland, Sept. 9-13. Three will deal with newly discovered non-destructive tests of welds. One of these tests, based on electrical conductivity, is the discovery of Elmer Sperry, well-known inventor and president of the American Society of Mechanical Engineers. The second involves the use of the stethoscope and the third X-ray methods.

Other research papers cover "nitrogen needles," electric welding by the carbon and metallic arcs, special metallographic studies, stress-strain characteristics of welded joints and the use of X-rays in examining welds.

Offers Course on Diesels

NEW YORK, Aug. 12—The Polytechnic Institute of Brooklyn is again offering an evening course on Diesel engines, which has been a feature of its curriculum for the last six years. This course is intended mainly to train personnel for the operation of such engines. It consists of 20 lectures of two hours each and 20 periods in the laboratory and classroom. The lecturers are Julius Kuttner, editor of *Oil Engine Power*, and Edgar J. Kates, consulting engineer of New York. The laboratory and classroom work will be given by Profs. Moore and Carvin of the Polytechnic Institute. An additional feature of the course will be two lectures on Lubricating and Fuel Oils, by C. V. Bacon, chemical engineer of New York.

Dominion Screw Incorporates

WINDSOR, ONT., Aug. 14—Dominion Screw Products, Ltd., has incorporated with a capitalization of \$100,000.

Calendar of Coming Events

SHOWS

Automotive Exhibit, Canadian National Exhibition, Toronto Aug. 23-Sept. 7
Vienna Fair Sept. 1-8
International Aircraft Exhibit, Coliseum, Chicago Sept. 7-15
National Machine Tool Builders' Exposition and Congress, Cleveland, Sept. 30-Oct. 4
Paris, Automobiles Oct. 3-13
London, Automobiles Oct. 17-26
Prague, Automobiles Oct. 23-30
Paris, Motorcycles Oct. 23-Nov. 3
M.&E.A. Show and Convention, Chicago Nov. 4-9
N.S.P.A. Show and Convention, Detroit Nov. 11-16
Berlin Auto Salon Nov. 14
London, Trucks Nov. 7-16
Paris, Trucks Nov. 14-24
London, Motorcycles Nov. 30-Dec. 7
Brussels Auto Salon Dec. 7
New York National Jan. 4-11
Chicago National Coliseum Jan. 25-Feb. 1
Cleveland Automobile Show Jan. 25-Feb. 1

CONVENTIONS

Second Pan-American Congress of Highways, Rio de Janeiro Aug. 16-31
American Welding Society, Fall Meeting and Exposition, Cleveland Sept. 9-12
American Institute of Mining and Metallurgical Engineers, Cleveland, Sept. 9-12

American Society for Steel Treating, Convention and Exposition, Cleveland Sept. 9-13
American Chemical Society, Fall Meeting, Minneapolis Sept. 9-13
A.S.M.E.—Iron and Steel Division—National Meeting, Cleveland Sept. 9-13
Society for Electrical Development, New York City Sept. 13
Eastern States Exposition, Springfield, Mass. Sept. 15-21
American Electric Railway Association, Atlantic City Sept. 28-Oct. 4
National Industrial Advertisers Assn., Cincinnati Sept. 30-Oct. 2
National Safety Congress, Annual, Chicago Sept. 30-Oct. 4
Penna. Automotive Association, Erie, Pa. Oct. 7-8
Permanent International Association of Road Congresses, Sixth Session, Washington, D. C. Oct. 7-11
Society of Industrial Engineers, Detroit Oct. 16-18
National Hardware Association, Atlantic City Oct. 21-24
Society of Industrial Engineers, Sixteenth Annual Meeting, Hotel Statler, Cleveland Oct. 23-25
Amer. Gear Mfrs. Assn., Phila. Oct. 24-26
World Engineering Congress, Tokyo, Japan Oct. 29-Nov. 22
National Automotive Parts Association, Detroit Nov. 6-8
Highway Research Board, Ninth Annual Meeting, Washington, D. C. Dec. 12-13

National Automobile Dealers Association, New York City Jan. 6
American Roadbuilders Association, Atlantic City Jan. 11-18
National Automotive Dealers Association, Chicago Jan. 27-28

RACES

British Tourist Trophy Race Aug. 17
Cleveland Aug. 18
National Air Races and Show, Cleveland, Aug. 24-Sept. 2
European Grand Prix, Italy Aug. 31
Altoona, Pa. Sept. 2
Schneider Trophy (Aeronautical), Calshot, England Sept. 7
Syracuse Sept. 8
Toledo Sept. 15
Los Angeles Nov. 17

S. A. E.

Aeronautic Meeting, Cleveland Aug. 26-28
Production Meeting, Cleveland Oct. 2-4
Transportation Meeting, Toronto Nov. 12-15
Annual Meeting, Detroit Jan. 21-24

SALONS

Hotel Drake, Chicago Nov. 9-16
Hotel Commodore, New York City Dec. 1-7
Hotel Biltmore, Los Angeles Feb. 8-15
Palace Hotel, San Francisco Feb. 22-Mar. 1